

Galatheid crustaceans of the genus *Munida* Leach, 1818, from French Polynesia.

by Enriqué MACPHERSON and Michèle DE SAINT LAURENT

Abstract. — Galatheid crustaceans of the genus *Munida* collected in several localities in French Polynesia have been studied. The collection contains 14 species, all of them here described as new : *Munida amathea*, *M. ducoussoi*, *M. evarne*, *M. hystrix*, *M. lenticularis*, *M. longicheles*, *M. ocellata*, *M. pasithea*, *M. plexaura*, *M. polynoe*, *M. profunda*, *M. pulchra*, *M. rubella*, and *M. rubrovata*. An identification key for all of these species is provided.

Résumé. — Les espèces du genre *Munida* récoltées en Polynésie française qui font l'objet de cette étude comprennent une centaine de spécimens, répartis en 14 espèces, toutes nouvelles pour la science : *Munida amathea*, *M. ducoussoi*, *M. evarne*, *M. hystrix*, *M. lenticularis*, *M. longicheles*, *M. ocellata*, *M. pasithea*, *M. plexaura*, *M. polynoe*, *M. profunda*, *M. pulchra*, *M. rubella* and *M. rubrovata*. La grande majorité des échantillons a été récoltée au casier, l'ensemble provient de profondeurs de 100 à un peu plus de 1000 m. Cette faune diversifiée peut être séparée en plusieurs groupes, possédant chacun des formes plus ou moins affines dans l'Indo-Ouest Pacifique. Ces *Munida* sont, dans l'ensemble, très vivement colorées. Leur étude systématique est précédée par un tableau de détermination. Trois espèces, *Munida normani* Henderson, 1885, *Munida* cf. *pilosimanus* Baba, 1969 et *Munida* cf. *soelae*, Baba, 1986, appartenant à un groupe taxonomique jusqu'à présent inclus dans le genre *Munida*, mais devant être rattachées à un nouveau genre, en cours de description, ont aussi été récoltées dans les eaux polynésiennes ; elles n'ont pas été prises en considération dans ce travail.

E. MACPHERSON, Instituto de Ciencias del Mar, Paseo Nacional, s/n, 08039 Barcelona, Spain.

M. DE SAINT LAURENT, Laboratoire de Zoologie (Arthropodes), Muséum national d'Histoire naturelle, 75005 Paris, France.

INTRODUCTION

The crustacean decapod fauna of French Polynesia has received some attention during recent years (i.e. BRUCE, 1989 ; PEYROT-CLAUSADE, 1989 ; GUINOT, 1991 ; CHAN and CROSNIER, 1991, ZARENKOV and KHODKINA, 1981, and references cited herein). In these papers, the description of interesting new species has pointed to our lack of knowledge and also to the peculiar decapod fauna in this area of the Pacific ocean.

No species of the genus *Munida* have been reported before from Polynesia, although some papers on *Paramunida* and other galatheids from the Central Pacific have been published (BABA, 1981 ; TITGEN, 1987). With 14 species new to science, the collection obtained during the radiobiologic survey carried out in French Polynesia by the Service Mixte de Contrôle

Biologique de l'Armée (SMCB) is most interesting and fills a gap in the knowledge of this poorly studied group.

Considering that about 35 true *Munida* (BABA, 1988) are known from the Indo-West Pacific region, the discovery of 14 new species in French Polynesian waters appears proportionally very large; this however reflects the general lack of knowledge of bathyal galatheids in the whole Indo-Pacific area. A preliminary study by one of us (E.M.) shows that many undescribed species are also present in New Caledonian waters.

After the most important work of BABA on the Albatross galatheids from Philippine and Indonesian waters (1988), the study of the Polynesian material also points out the importance of several morphological characters (i.e. size and number of lateral spines on the carapace, ornamentation of the thoracic sternites, sizes of antennular and antennal spines), that can be easily applied in species identification (see also RICE and DE SAINT LAURENT, 1985; de SAINT LAURENT and MACPHERSON, 1988).

Through the active collaboration of J. POUPIN, who provided colour slides of many specimens, the colour pattern of most species fortunately could be included in the descriptions. In some cases, where the morphological distinction between close species presents some difficulties, the knowledge of colouration can be a great help in identification.

BABA (1988) created a new genus, *Paramunida*, to accommodate seven Indo-West Pacific species, of which five had previously been included in *Munida*. The diagnostic characters of *Paramunida* are the lack of transverse setiferous striae on the dorsal carapace, and the lack of pleopods on the first abdominal segment in males. We believe that the second character is a most important one in the taxonomy of the family Galatheidae, and that a number of species, still included in *Munida*, but sharing this character (and some others) with *Paramunida*, should also be excluded from the genus and be accommodated into a further new one. For that reason, three species collected in French Polynesia during the SMCB survey have not been included in the present publication. These species are *Munida normani* Henderson, 1885, *Munida* sp. cf. *pilosimanus* Baba, 1969 and *Munida* sp. cf. *soelae* Baba, 1986. They will be reported upon in a further paper.

The genus *Munida* is thus restricted here to species bearing two pairs of male gonopods (PI1 and PI2).

The types of the new species and the other material are deposited in the collections of the Muséum national d'Histoire naturelle, Paris (MNHN). Measurements given in this paper are of carapace length, excluding rostrum.

The terminology for the carapace dorsal spines and regions mainly follows ZARIQUIEY-ALVAREZ (1952), but we have named the outer orbital spine of ZARIQUIEY-ALVAREZ as the first anterolateral spine, assuming that in the genus *Munida* there is not a true orbit (as in some other genera of Galatheids). This spine can be situated at the anterolateral angle or on the frontal border, near this angle. In our descriptions, the term "overreaching" is used in the sense of reaching beyond the end or the extremity of the quoted segment of appendage.

KEY TO SPECIES OF THE GENUS *Munida* FROM FRENCH POLYNESIA

1. — Anterior half of dorsal carapace with numerous, regular spines, extending to second postcervical striae (fig.1a). Second abdominal tergite unarmed *M. hystrix*

- Anterior half of carapace with at most one row of epigastric spines and one or two spines on parapehatic and branchial regions. Second abdominal tergite with or without spines..... 2
- 2. — Five well developed spines on lateral margins of carapace behind cervical groove..... 3
- Three or four well developed spines on lateral margins of carapace behind cervical groove.. 7
- 3. — One pair of epigastric spines on anterior region of carapace..... *M. profunda*
- At least two pairs of epigastric spines..... 4
- 4. — Eyes small, maximum corneal diameter less than 1/4 length of anterior border of carapace between anterolateral spines. Distomesial spine of basal antennular segment longer than distolateral spine..... *M. ducoussoi*
- Eyes large, maximum corneal diameter at least 1/3 length of anterior border of carapace between anterolateral spines. Distomesial spine of basal antennular segment shorter than distolateral spine..... 5
- 5. — Distomesial spine of second antennal segment overreaching peduncle. Fixed finger of chelipeds with a row of spines along whole of lateral border..... *M. rubrovata*
- Distomesial spine of second antennal segment shorter than peduncle. Fixed finger of chelipeds with proximal spines only..... 6
- 6. — Small median depression on intestinal region, without striae or scales. Anterolateral spine slightly longer than following spine..... *M. amathea*
- No median depression on intestinal region, one wide median stria. Anterolateral spine three times longer than the following spine..... *M. rubella*
- 7. — Abdominal tergites unarmed..... *M. plexaura*
- Second abdominal tergite with spines..... 8
- 8. — Lateral parts of fifth to seventh thoracic sternites with marked carinae (fig.8)..... 9
- Lateral parts of fifth to seventh thoracic sternites without carinae (fig. 13)..... 13
- 9. — Distal spines of basal antennular segment subequal. One row of spines along lateral border of cheliped fixed finger. Four marginal spines on carapace behind cervical groove. *M. lenticularis*
- Distomesial spine of basal antennular segment much shorter than distolateral spine. Spines on mesial border of cheliped fixed finger, if present, limited to proximal half. Three or four marginal spines on carapace behind cervical groove..... 10
- 10. — Four spines on lateral margins of carapace behind cervical groove. Fixed finger of chelipeds with several spines on proximal half of dorsolateral border..... 11
- Three spines on lateral margins of carapace behind cervical groove (but see *M. longicheles* p. 409).
- No spine on proximal half of dorsolateral border of fixed finger of chelipeds..... 12
- 11. — Cornea maximum diameter less than 1/3 length of anterior border of carapace between anterolateral spines. In fresh specimens, dorsal carapace with one yellow-orange spot, circled with whitish on each antero-branchial region..... *M. ocellata*
- Cornea maximum diameter more than 1/3 length of anterior border of carapace between anterolateral spines. In fresh specimens, dorsal carapace without spots on antero-branchial regions..... *M. pulchra*
- 12. — Cornea maximum diameter slightly more than 1/3 length of anterior border of carapace between anterolateral spines. Propodus of second pereiopod less than twice dactylus length..... *M. longicheles*
- Cornea maximal diameter clearly less than 1/3 length of anterior border of carapace between anterolateral spines. Propodus of second pereiopod more than twice dactylus length. *M. polynoe*
- 13. — Distomesial spine of basal segment of antennular peduncle longer than distolateral spine. Lateral parts of thoracic sternite 7 with some coarse granules. Frontal border of carapace strongly oblique..... *M. evarne*
- Distal spines of basal segment of antennular peduncle subequal. Lateral parts of thoracic sternites 6 and 7 with many small granules. Frontal border of carapace slightly oblique .. *M. pasithea*

1. *Munida hystrix* sp. nov.

(Fig. 1; pl. 1A)

MATERIAL EXAMINED. — Tuamotu Islands, Mururoa, stn 222, 15.05.1990, 21°51.1'S, 138°58.7'W, 100 m: 1 ♂ 14 mm (holotype, MNHN Ga 1917), 1 ♂ 13.5 mm (paratype, MNHN Ga 1918).

ETYMOLOGY. — From the Latin, *hystrix*, porcupine, in reference to the numerous spines of the anterior part of the carapace.

DIAGNOSIS. — Carapace with numerous striae, dorsally armed with numerous spines on anterior half, except in meso- and metagastric regions. Frontal margins strongly oblique. Rostrum dorsally carinated, slightly curved. Supraocular spines not reaching midlength of rostrum and end of corneas. Branchial margins with four spines. Lateral parts of last thoracic sternites without carinae. Second abdominal tergite unarmed, with a single transverse stria. Eyes large. Mesial distal spine of antennular basal segment slightly shorter than lateral. Distomesial spine of basal antennal peduncle short, not overreaching second segment. Merus of third maxilliped with three marginal spines on the flexor margin, extensor margin unarmed. Chelipeds and walking legs squamous, lacking epipods. Chelae with numerous rows of spines. Dactylus of walking legs about half propodus length.

DESCRIPTION (holotype)

Carapace, excluding rostrum, slightly longer than wide. Transverse ridges mostly interrupted, with short non-iridescent setae. Main transverse striae on posterior part of carapace interrupted in cardiac region. Secondary striae practically absent. Anterior half of carapace covered with numerous spines, except in meso- and metagastric regions.

Frontal margins strongly oblique, lateral margins slightly convex. First anterolateral spine short, not reaching the base of supraocular spine and situated on frontal margin between this spine and anterolateral angle; second anterolateral spine somewhat smaller than preceding one. One or two spinules between supraocular spine and first anterolateral spine and one small spinule between first and second anterolateral spines. Branchial margin with four spines decreasing in size posteriorly.

Rostrum horizontal, slightly sinuous, half as long as remaining carapace. Supraocular spines short, not reaching to midlength of rostrum, subparallel, upwardly directed.

Fourth thoracic sternite ornamented with some short arcuate striae; fifth to seventh sternites without marked carinae. Transverse ridges between fifth, sixth and seventh sternites obtuse, slightly granulated.

Second abdominal tergite unarmed. Second to fourth tergites with one single transverse stria, continuous on second and third, interrupted medially on fourth. Fifth tergite with one weak stria, widely interrupted medially.

Eyes large, maximum corneal diameter more than one-third the distance between bases of anterolateral spines.

Basal segment of antennule (distal spines excluded) elongate, not overreaching corneas, less than one-quarter carapace length; two short distal spines, mesial one slightly shorter than

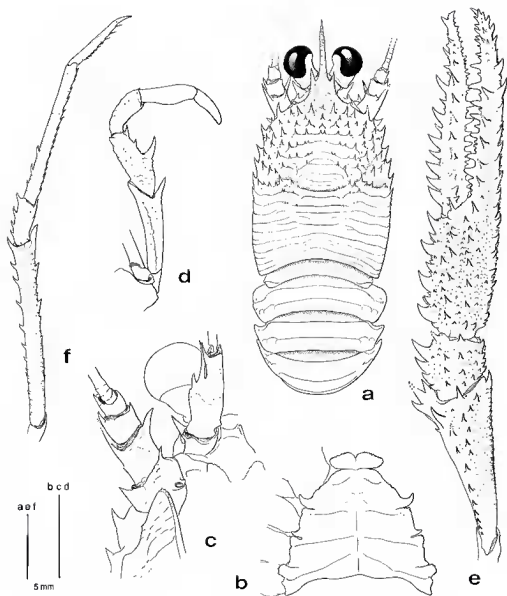


FIG. 1. — *Munida hystrix* sp. nov., holotype, male 14 mm (MHN Ga 1917) : a, carapace, dorsal view; b, sternal plastron; c, ventral view of cephalic region, showing antennula and antenna peduncles; d, right third maxilliped, lateral view; e, right cheliped, dorsal view; f, right second pereopod, lateral view.

lateral, and two lateral spines, proximal one short, located at midlength of segment, distolateral spine long, overreaching distal spines.

First segment of antennal peduncle with short, strong distomesial and distolateral spines, shorter than second segment; second segment with two long distal spines, lateral spine overreaching penultimate segment; penultimate segment with two short distal spines, lateral spine longer than third; last segment with one small distolateral spine.

Ischium of third maxilliped slightly more than 1.5 times length of merus, measured along extensor margin, distoventrally bearing spine. Merus with three spines on flexor margin, proximal longer than others. Extensor margin unarmed.

Chelipeds subequal. Right appendage more than 3 times as long as carapace. Merus slightly shorter than carapace, *c.* 2.5 times longer than carpus and slightly longer than palm; palm twice as long as high and more than half finger length. Merus furnished with long, dense setae on mesial margin, armed with one mesial row of spines, some scattered spines on dorsal and ventral sides; a projection on mesial distal margin with five strong spines of different size; one distolateral spine. Carpus also with mesial row of strong spines, and several spines on dorsal, lateral and ventral sides. Palm with many spines and acute granules on mesial, dorsal and lateral sides; one mesial row of spines, four of them very strong, two dorsal rows of strong spines, dorsolateral row of spines, continuing along fixed finger. Fingers distally curving, with crossing ends; fixed finger with one dorsal row, movable finger with mesial and dorsal rows, of strong spines; cutting edges of both fingers with teeth of different sizes. Left cheliped slightly gaping.

Walking legs slender, furnished with long, plumose setae, some of them iridescent, on dorsal margin, and with some scattered setae on lateral borders. Second pereiopods slightly less than 3 times carapace length. Merus slightly longer than carapace, 8 to 9 times as long as high, *c.* 4.5 times carpus length and 1.5 times as long as propodus; propodus *c.* 10 times as long as high and twice dactylus length. Merus with one dorsal row of 12-14 spines increasing in size distally, ventral margin with long distal spine and with 1-2 projected scales on distal half. Carpus with one long distal spine on dorsal and ventral borders, 3-4 additional spines on dorsal margin. Propodus with ventral row of 14-17 movable spines (spiniform setae) on ventral margin and 3-4 dorsolateral proximal spines. Dactylus long, dorsal margin straight, curving distally, with ten ventral movable spinules. Third pereiopod similar to second, slightly shorter. Fourth pereiopod shorter than second and third, less spinulated; length of merus $3/4$ that of second pereiopod. Epipods absent from all pereiopods.

Colour: Ground colour whitish. Anterior part of carapace pink with reddish spots on hepatic and mesogastric areas. Transverse red band, interrupted medially, crossing posterior half of carapace. Second to fourth abdominal tergites with one transverse reddish band; fifth and sixth tergites and telson whitish. Tip of rostrum red. Chelipeds with red bands on distal part of carpus and palm; median red band on fingers. Walking legs with whitish and pinkish bands.

VARIATIONS. — No significant differences have been observed between holotype and paratype.

REMARKS. — The characteristic spinulation of the carapace and chelipeds of this species distinguishes it easily from the other *Munida* of French Polynesia. Its nearest relative appears to be *M. brucei* Baba, 1974 from the eastern coast of Kenya (BABA, 1974; 1988). The two species differ in the following aspects:

- the spines on the anterior part of the carapace are longer and more numerous in the new species than in *M. brucei*;
- the fingers of the chelipeds are more than twice as long as the palm in *M. brucei*, they are shorter in the new species.

The colour pattern of the two species is also distinct : *Munida hystrix* has reddish spots and bands on the carapace, abdomen and chelipeds, while in *M. brucei* these spots and bands are pale or purplish and they differ in their pattern.

DISTRIBUTION. — Tuamotu Islands (Mururoa), 100 m depth.

2. *Munida profunda* sp. nov.

(Fig. 2 ; pl. 1B)

MATERIAL EXAMINED. — Tuamotu Islands, Fangataufa, str 327, 24.10.1990, 22°16.7'S, 138°42.8'W, 1050 m, trap : 1 ♀ ov. 17.0 mm (holotype MNHN Ga 1997).

ETYMOLOGY. — The name *profunda* refers to the great depth at which this species occurs.

DIAGNOSIS. — Carapace distinctly rugose, dorsally armed with two epigastric spines, one anterior branchial spine on each side. Frontal margins nearly transverse. Rostrum slightly curved upwards. Supraocular spines feebly divergent, reaching midlength of rostrum and end of corneas. Branchial margins with five spines. Fifth to seventh thoracic sternites without marked lateral carinae. Second abdominal tergite with seven spines and one transverse stria. Eyes small. Distomesial spine of antennular basal segment shorter than lateral. Distal spine of basal antennal peduncle slightly overreaching second segment. Merus of third maxilliped with one ventral marginal spine and one distal acute granule, extensor margin unarmed. Chelipeds and walking legs squamous, lacking epipods. Dactylus of walking legs slightly more than half propodus length.

DESCRIPTION (holotype)

Carapace, excluding rostrum, slightly longer than wide. Dorsal surface with distinct striae and dense, short, non-iridescent setae. Transverse ridges mostly interrupted. Main transverse striae on posterior part of carapace interrupted in the cardiac region. Secondary striae almost absent. Hepatic and anterior branchial regions scarcely squamous. Gastric region with two epigastric spines, just behind supraocular spines. Each anterior branchial region with one spine.

Frontal margins transverse, lateral margins slightly convex. Anterolateral spine well developed, situated at anterolateral angle, overreaching level of sinus between rostrum and supraocular spine. Second marginal spine before cervical groove somewhat smaller than preceding one. Branchial margin with five spines, first larger.

Rostrum half as long as remaining carapace, slightly curved upwards. Supraocular spines reaching to midlength of rostrum, and end of corneas, feebly divergent and upwardly directed.

Fourth thoracic sternite with some short arcuate striae ; fifth to seventh sternites glabrous. Transverse ridges between fifth, sixth and seventh sternites obtuse, slightly granulated.

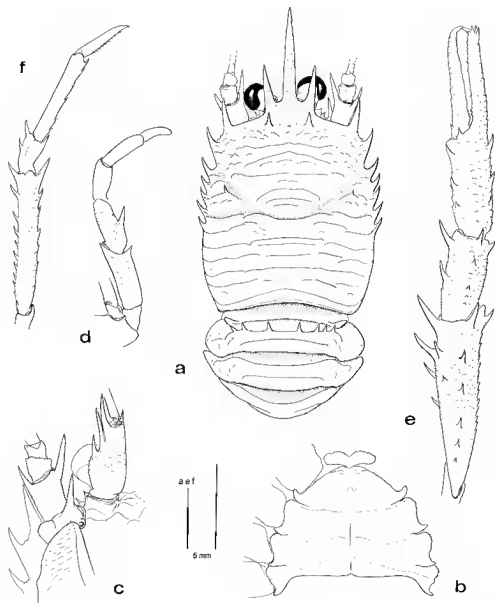


FIG. 2. — *Munida profunda* sp. nov., holotype, female 17 mm (MNHN Ga 1997) : a, carapace, dorsal view ; b, sternal plastron ; c, ventral view of cephalic region, showing antennula and antenna peduncles ; d, right third maxilliped, lateral view ; e, right cheliped, dorsal view ; f, right second pereopod, lateral view.

Second abdominal tergite with one row of seven spines on anterior border. Second and third tergites unarmed, with one strong continuous transverse stria; fourth and fifth also with one stria, less conspicuous, and widely interrupted medially.

Eyes small, maximum corneal diameter less than one-quarter the distance between bases of anterolateral spines.

Basal segment of antennule (distal spines excluded) elongate, *c.* one quarter carapace length, overreaching corneas; distomesial spine clearly shorter than distolateral; two spines on lateral border, proximal spine short, located at midlength of segment, second lateral long, not overreaching distolateral spine.

First segment of antennal peduncle with one strong distomesial spine, about as long as second segment; second segment with two long distal spines, mesial spine clearly longer than lateral, overreaching antennal peduncle; penultimate segment unarmed.

Ischium of third maxilliped *c.* 1.5 times length of merus, measured along extensor margin, distoventrally bearing small spine. Flexor margin of merus bearing one median well developed spine, and one distal acute granule; extensor margin without spines.

Chelipeds feebly squamous, subequal, with long plumose setae more dense on mesial borders of articles. Right cheliped *c.* 2.5 times as long as carapace. Merus slightly shorter than carapace, *c.* twice as long as carpus and 1.5 times longer than palm; palm 2.5 times as long as high and slightly shorter than fingers. Merus armed with four prominent distal spines, mesial spine strongest, not reaching middle of carpus. Carpus with one dorsal row of spines and scattered spines on mesial and ventral sides. Palm with one mesial and one dorsolateral row of spines, not continuing along fixed finger. Fingers distally curving and crossing, ending in sharp point; dactylus with one small proximomesial spine, fixed fingers with 2-3 distal spines; cutting edges with small teeth of unequal sizes.

Walking legs slender, furnished with long, plumose setae on dorsal margin and with some short setae on lateral borders. Second pereiopod twice carapace length; merus slightly shorter than carapace, 7 times as long as high, *c.* 4 times carpus length and 1.5 times as long as propodus; propodus *c.* 5 times as long as high and 1.5 times dactylus length. Merus with dorsal row of 10-11 spines, increasing in size distally, ventral border with one long distal spine and three projecting scales on distal half. Carpus with two dorsal and one ventrodorsal spines. Propodus with six movable spines on ventral margin. Dactylus long, dorsal margin straight, slightly curving distally, with 9-10 movable spinules along ventral margin. Third pereiopod similar to second. Fourth pereiopod shorter than second and third pereiopods and less spinulated. Merus of fourth pereiopod half length of second pereiopod. Epipods absent from all pereiopods.

Colour: Ground colour of carapace and anterior abdominal segments pinkish. Posterior abdominal segments and telson white. Striae on carapace and second abdominal segment reddish. Distal part of rostrum, of supraocular spines, and all carapace spines red. Chelipeds pink, the spines and distal half of fingers red. Walking legs pink, distal spines of merus and carpus and distal half of dactylus reddish.

REMARKS. — *Munida profunda* resembles *M. andamanica* Alcock, 1894, a widespread species throughout the Indo-West Pacific. BABA (*pers. commun.*) believes that several species have been confused under this name. After considering the descriptions and illustrations of ALCOCK (1894; 1901) and of ALCOCK and ANDERSON (1895), our new species differs from *M. andamanica*

in that the eyes are clearly smaller and the number of epigastric spines are reduced to one pair. Moreover, the distomesial spine of the basal antennular segment is much smaller than the distolateral in *profunda*, whereas these spines are subequal in *andamanica*.

Considering the size of the eyes, *M. profunda* is close to *M. remota* Baba, 1990, from Madagascar. The two species differ however by the number of epigastric spines, more numerous in *remota*, and by the relative sizes of the distal spines of the second antennal segment; but the most important character to separate them is perhaps the presence of two spines on the flexor margin of the merus of the third maxilliped in *remota*, instead of one in *profunda*.

DISTRIBUTION. — Tuamotu Islands (Fangataufa), 1050 m depth.

3. *Munida ducoussoi* sp. nov.

(Fig. 3)

MATERIAL EXAMINED. — Tuamotu Islands, Makemo, stn 308, 07.10.1990, 16°34.5'S, 143°39.9'W, 280 m, trap : 2 ♂ 13 and 18.5 mm (MNHN Ga 1995). — Tubuai Islands (Iles Australes), Raivavae, 01.03.1989, 23°50'S, 147°43.4'W, 550 m, trap : 1 ♂ 18.5 mm (holotype MNHN Ga 1893).

TYPES. — One male (18.5 mm) from Raivavae (Tubuai Islands) has been selected as holotype (MNHN Ga 1893). The other specimens are paratypes.

ETYMOLOGY. — It is a pleasure to dedicate this species to R. DUCOUSO, head of the scientific program of the SMCB, for his support of this work.

DIAGNOSIS. — Carapace with numerous striae, dorsally armed with 11 epigastric spines; parahepatic, hepatic, anterior branchial and postcervical spines present. Frontal margins somewhat oblique. Rostrum slightly curved. Supraocular spines reaching midlength of rostrum and end of corneas. Branchial margins with five spines. Fifth to seventh thoracic sternites without lateral carinae, lateral parts of seventh sternite with numerous coarse granules. Second abdominal tergite with four pairs of spines and three transverse striae. Eyes small. Distomesial spine of antennular basal segment longer than distolateral. Distal spine of basal antennal peduncle overreaching penultimate segment. Merus of third maxilliped with three ventral marginal spines, dorsal margin unarmed. Chelipeds and walking legs squamous, lacking epipods. Chelipeds fingers armed with spines along dorsolateral and mesial margins respectively. Dactylus of walking legs about half propodus length.

DESCRIPTION (holotype)

Carapace slightly longer than wide. Transverse ridges mostly interrupted. Main striae on posterior part of carapace interrupted in cardiac region. Secondary striae present. Gastric region with one row of 11 epigastric spines, largest pair just behind supraocular spines. One hepatic, parahepatic, branchial anterior and postcervical spine on each side.

Frontal margins somewhat oblique. Lateral margins slightly convex. Anterolateral spine well developed, situated at antero-lateral angle, overreaching the level of sinus between rostrum

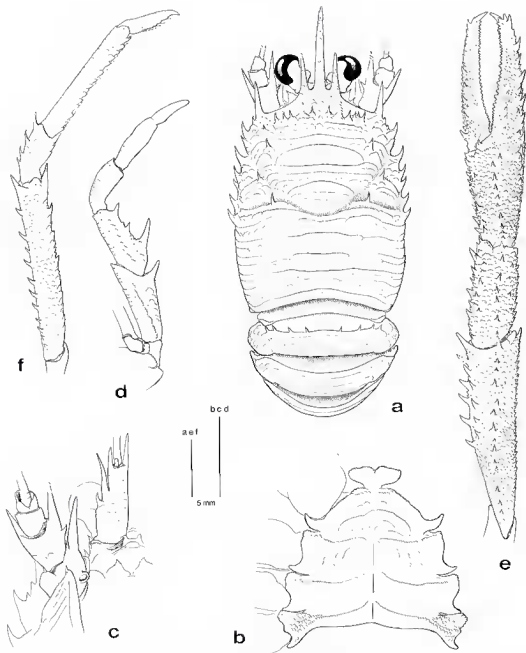


FIG. 3. — *Munida ducoussoi* sp. nov., holotype, male 18.5 mm (MNHN Ga 1893): a, carapace, dorsal view; b, sternal plastron; c, ventral view of cephalic region, showing antennule and antenna peduncles; d, right third maxilliped, lateral view; e, right cheliped, dorsal view; f, right second pereopod, lateral view.

and supraocular spine. Second marginal spine before cervical groove somewhat smaller than preceding one. Both of these spines with one basal spinule. Branchial margins with five spines of about similar size.

Rostrum horizontal, feebly sinuous, half as long as remaining carapace. Supraocular spines more slender than rostrum, reaching to its midlength and to end of corneas, subparallel and slightly upwardly directed.

Fourth thoracic sternite with some short but very conspicuous arcuate striae ; fifth sternite with several longitudinal oblique striae ; lateral parts of seventh sternite with numerous coarse granules. Transverse ridges between fifth, sixth and seventh sternites obtuse, slightly granulated.

Second abdominal tergite with one row of four pairs of spines on anterior border. Second to fourth abdominal tergites each with three transverse striae : the two anterior striae are continuous ; the third stria, less conspicuous, is interrupted medially on the fourth segment only.

Eyes small, maximum corneal diameter less than one-quarter the distance between bases of anterolateral spines.

Basal segment of antennule elongate, less (distal spines excluded) than one quarter carapace length, clearly overreaching cornea ; with two distal spines, distomesial spine distinctly longer than distolateral ; and two spines on lateral margin, proximal short, located at midlength of segment, distal long, not overreaching distomesial spine.

First segment of antennal peduncle with one strong distomesial spine, overreaching penultimate segment ; second segment with two long distal spines, mesial longer than lateral, overreaching antennal peduncle ; one additional small spinule on mesial margin ; penultimate segment unarmed.

Ischium of third maxilliped *c.* 1.5 times length of merus, measured along extensor margin ; distoventrally bearing spine. Merus bearing three well developed spines on flexor margin, proximal spine longer than others. Extensor margin unarmed.

Chelipeds squamous, subequal, furnished with iridescent setae more dense on mesial borders of articles. Right cheliped *c.* 2.5 times as long as carapace. Merus slightly shorter than carapace, *c.* twice as long as carpus and palm ; palm *c.* 1.5 times as long as high and slightly shorter than fingers. Merus armed with four rows of spines respectively on mesial, dorsal and ventral borders and with one distal spine on lateral margin. Carpus with one dorsal row of spines and several spines scattered on dorsal, mesial and ventral sides. Palm with two mesial rows of spines, one dorsal row of small spines and one row of dorsolateral spines continuing along fixed finger, reaching tip. Fingers distally curving and crossing, ending in a sharp point ; movable finger with one row of spines along mesial border, reaching tip ; cutting edges with small teeth of various sizes.

Walking legs slender, furnished with long, plumose, iridescent setae on dorsal margin, and with short setae on lateral borders. Second pereopod twice carapace length. Merus slightly shorter than carapace length, almost 7 times as long as high, *c.* 3.5 times carpus length and 1.5 time as long as propodus ; propodus *c.* 6.5 times as long as high and twice dactylus length. Merus with one dorsal row of 12 spines increasing in size distally and one long distal spine on ventral margin, with one additional spine on distal half. Carpus with long dorsodistal and ventrodistal spines, with three additional spines on dorsal margin. Propodus with one ventral row of 14-15 spiniform setae. Dactylus long, dorsal margin straight, feebly curving distally,

with 7-8 ventral spiniform setae. Third pereopod similar to second. Fourth pereopod shorter than second and third, less spinulated. Merus of fourth pereopod half as long as that of second pereopod. Epipods absent from all pereopods.

REMARKS. — *Munida ducousoi* resembles *Munida rubrovata* sp. nov. in the spinulation of the lateral margins of the carapace and of the abdominal segments. The two species differ mainly in that, in *M. ducousoi* :

— the eyes are much narrower : the maximum corneal diameter is *c.* one-quarter the length of the anterior border of the carapace, between the bases of the anterolateral spines ; in *M. rubrovata*, this ratio is more than one-third ;

— the distomesial spine of the basal segment of the antennule is longer than the distolateral spine ; in *M. rubrovata* the mesial spine is shorter than the lateral spine ;

— the distal spine of the first antennal segment is very long, overreaching the penultimate segment ; in *M. rubrovata* this spine is shorter, only reaching the end of the second segment ;

— the dactyli of the chelipeds have a mesial row of spines, reaching the tip of the finger ; in *M. rubrovata* there is only one proximal spine.

The best character to distinguish the two species is the sternum ornamentation, richly furnished with arcuate striae and with numerous granules on lateral parts of seventh sternites in *ducousoi*, almost smooth in *rubrovata*.

DISTRIBUTION. — Tuamotu (Makemo) and Tubuai (Raivavae) Islands. Depths between 280 and 550 m.

4. *Munida rubrovata* sp. nov.

(Fig. 4 ; pl. 1C)

MATERIAL EXAMINED. — Society Islands, Moorea, stn 258, 18.06.1990, 17°31.9'S, 149°35.3'W, 430 m, trap : 1 ♀ ov. 12.5 mm (MNHN Ga 1901). — Tuamotu Islands, Fangataufa, stn 323, 23.10.1990, 22°13.2'S, 138°42.7'W, 500 m, trap, 2 ♂ 12 mm, 1 ♀ ov. 13 mm (MNHN Ga 1992) ; Mururoa, 1984, without other explanation (n° 075159 A & 075172 A) : 1 ♂ 11.5, 1 ♀ ov. 11.5 mm (MNHN Ga 1902). — Tubuai Islands, Raivavae, 01.03.1989, 23°51.4'S, 147°44.5'W, 300 m, trap : 1 ♂ 16.5 mm (MNHN Ga 1896) ; Rimatarā, 03.09.1988, 500-700 m, trap : 1 ♂ 14.5 mm (holotype MNHN Ga 1899), 5 ♂ 9.5 to 14.5 mm (MNHN Ga 1900).

TYPES. — One male (14.5 mm) from Rimatarā (Tubuai) has been selected as holotype (MNHN Ga 1899). The other specimens are paratypes.

ETYMOLOGY. — From the Latin *rubra*, red, *ova*, eggs, in reference to the deep red colouration of the eggs.

DIAGNOSIS. — Carapace dorsally armed with four pairs of epigastric spines ; parahepatic, anterior branchial and postcervical spines present. Frontal margins nearly transverse. Rostrum almost horizontal. Supraocular spines not reaching to midlength of rostrum and end of corneas. Branchial margins with five spines. Fifth to seventh thoracic sternites without lateral carinae, lateral parts of seventh sternite smooth.

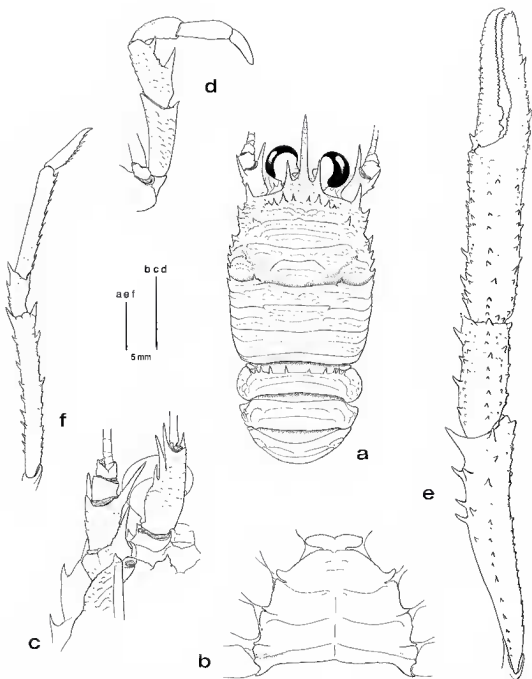


FIG. 4. — *Munda rubrovata* sp. nov.: a, carapace, dorsal view; b, sternal plastron; c, ventral view of cephalic region, showing antennula and antenna peduncles; d, right third maxilliped, lateral view; e, right cheliped, dorsal view; f, right second pereiopod, lateral view. a, c, f: holotype, male 14.5 mm (MNHN Ga 1899); b, c, d: paratype, female 12.5 mm (MNHN Ga 1901).

Second abdominal tergite with five pairs of spines and two transverse striae. Eyes large. Distomesial spine of antennular basal segment shorter than distolateral. Distal spine on basal segment of antennal peduncle not overreaching second segment. Distomesial spine of second segment overreaching peduncle. Merus of third maxilliped with two marginal spines on flexor margin, extensor margin unarmed. Chelipeds and walking legs squamous, lacking epipods. Chelipeds with fixed fingers armed with spines all along dorsolateral margin. Dactylus of walking legs about half propodus length.

DESCRIPTION (holotype)

Carapace slightly longer than wide. Transverse ridges mostly interrupted, with short, not iridescent setae. Main striae on posterior part of carapace interrupted in cardiac region. Secondary striae almost absent, some small scales between main striae. Gastric region with one row of four pairs of epigastric spines, largest pair just behind supraocular spines. One parahepatic, one branchial anterior and one postcervical spine on each side.

Frontal margins nearly transverse, lateral margins slightly convex. Anterolateral spine well developed, situated at anterolateral angle, not overreaching sinus between rostrum and supraocular spine. Second marginal spine before cervical groove somewhat smaller than preceding one. Both spines bearing one basal spinule. Branchial margins with five spines, decreasing in size posteriorly.

Rostrum almost horizontal, slightly curved upwards, half as long as remaining carapace. Supraocular spines not reaching midlength of rostrum and end of corneas, subparallel and upwardly directed.

Fourth thoracic sternite with a few very short, oblique, arcuate striae; fifth to seventh sternites smooth. Transverse ridges between fifth, sixth and seventh sternites obtuse, very slightly granulated.

Second abdominal tergite with one row of five pairs of spines on anterior border. Second to fourth abdominal tergites each with two transverse striae, anterior stria weak, interrupted medially, second stria strong, continuous. Fifth segment with two continuous striae.

Eyes large, maximum corneal diameter more than 1/3 the distance between bases of anterolateral spines.

Basal segment of antennule elongate, *c.* 1/3 carapace length (distal spines excluded), slightly overreaching corneas, with two long distal spines, mesial one shorter than distolateral; and two lateral spines, proximal short, located at middle of segment, distal long, not overreaching distolateral spine.

First segment of antennal peduncle with one strong distomesial spine, not overreaching second segment; second segment with two long distal spines, mesial longer than lateral, clearly overreaching antennal peduncle; one additional spinule at middle of mesial margin (left side only); penultimate segment unarmed.

Ischium of third maxilliped *c.* 1.5 times length of merus, distoventrally bearing spine. Merus with two well developed spines on flexor margin, distal smaller; extensor margin unarmed.

Chelipeds moderately squamous, subequal, with numerous short setae, more dense on mesial borders of articles. Right cheliped three times as long as carapace; merus *c.* 1.5 times longer than carapace, twice longer than carpus and slightly more than 1.5 times longer than palm; palm *c.* 1.5 times longer than carpus, more than twice as long as high and slightly

shorter than fingers. Merus armed with four rows of spines. Carpus with several spines scattered on dorsal, mesial and ventral sides. Palm with several spines scattered on mesial and dorsal sides and with one row of dorsolateral spines continuing along fixed finger and reaching tip. Fingers distally curving and crossing, ending in sharp point ; one proximal spine on mesial margin of dactylus ; cutting edges with small teeth of various sizes.

Walking legs elongate, furnished with long, plumose setae (some iridescent), on dorsal margin, and with short, dense setae on lateral borders. Second pereopod twice as long as carapace length. Merus of second pereopod slightly shorter than carapace length, 8 times longer than high, four times carpus length and *c.* 1.5 times as long as propodus ; propodus *c.* 7 times as long as high and slightly more than 1.5 times dactylus length. Merus with one dorsal row of 11 spines increasing in size distally, one long distal spine on ventral edge and 2-3 projected scales on distal half. Carpus with long dorsodistal and ventrodistal spines and three additional spines on dorsal margin. Propodus with one ventral row of 10-12 spiniform setae. Dactylus with dorsal margin slightly convex on proximal half, feebly curving distally, with eight ventral spiniform setae. Third pereopod similar to second, but shorter ; fourth shorter than second and third, less spinulated. Merus of fourth pereopod half that of second pereopod. Epipods absent from all pereopods.

Colour : Totally but unevenly reddish ; transverse red bands on gastric, cardiac and antero-branchial regions. Striae on carapace and abdomen tinged with red. Sixth abdominal segment and telson pinkish, Chelipeds and walking legs with alternate white and red bands.

VARIATIONS. — No significant variations in the main characters have been observed between the specimens examined. However, as in most species of the genus *Munida* and in other decapods, the size and shape of the chelipeds change with sex and carapace length. The chelipeds in the males examined are *c.* 3 times the carapace length, and the merus is longer than the carapace ; in the females, the chelipeds are less than 3 times the carapace length, and the merus is only as long as the carapace.

REMARKS. — *Munida rubrovata* is closely related to *M. heteracantha* Ortmann, 1892. A comparison with the lectotype of *M. heteracantha* from Japan (Sagami Bay, ovigerous female of 7.3 mm, Strasbourg Museum) showed that they can be easily distinguished by the following characters :

- the new species has the lateral parts of the seventh sternite smooth, except for a few granules ; *M. heteracantha* has numerous granules on the lateral parts of the seventh sternite ;
- the distal spines of the basal segment of the antennular peduncle are subequal in *M. heteracantha*, whereas the mesial spine is shorter than the lateral in the new species ;
- the distal spine of the first antennal segment is very long in *M. heteracantha*, overreaching the antennal peduncle ; this spine does not overreach the second segment in *M. rubrovata* ;
- the dactylus of the walking legs have one row of spinules along the ventral margin in the new species, in *M. heteracantha* the distal half of the ventral border is unarmed.

Munida rubrovata is also close to *M. amathea* sp. nov., however both are easily distinguishable by several characters (see remarks for *M. amathea*).

SIZE. — The males ranged between 9.5 and 16.5 mm, females (ovigerous) between 11.5 and 13 mm.

DISTRIBUTION. — Society Islands (Moorea), Tuamotu Islands (Fangataufa, Mururoa) and Tubuai Islands (Raivavae), between 300 and 700 m.

5. *Munida amathea* sp. nov.

(Fig. 5)

MATERIAL EXAMINED. — Tuamotu Islands, Fangataufa, 22.11.1988, 22°15'S, 138°47.3'W, 600-800 m, trap : 1 ♂ 21 mm (holotype MNHN Ga 1868), 8 ♂ 20.5 to 23.5 mm, 3 ♀ 17.5 to 18.5 mm, 1 ♀ ov. 18.5 mm (MNHN Ga 1869); 21.02.1989, 22°12.9'S, 138°47.3'W, 700 m, trap : 10 ♂ 16 to 24.5 mm, 4 ♀ 13 to 21.5 mm (MNHN Ga 1898); Gambier, stn 312, 11.10.1990, 23°04'3S, 135°02, 1'W, 740 m, trap : 3 ♂ 22 to 25 mm, 3 ♀ ov. 15 to 22 mm (MNHN Ga 1989); Makemo, 12.11.1988, 16°37'S, 143°32'W, 650-750 m, trap : 6 ♂ 17 to 22 mm (MNHN Ga 1867); Marutea Sud, 20.11.1989, 21°34'S, 135°36'W, 690 m, trap : 4 ♂ 18 to 22.5 mm (MNHN Ga 1897); Mururoa, 28.06.1988, 560-600 m, trap : 2 ♂ 20.5 and 22 mm (MNHN Ga 1870). — Tubuai Islands (Iles Australes), Rapa, 04.03.1989, 27°35.5'S, 144°15.8'W, 640-670 m, trap : 2 ♂ 13.5 mm, 1 ♀ 12.5 mm (MNHN Ga 1894); Maria, stn 354, 08.12.1990, 21°47.8'S, 154°43.6'W, 710 m, trap : 10 ♂ 14 to 26 mm, 5 ♀ ov. 17 to 21 mm (MNHN, Ga 2027).

TYPES. — One male (21 mm) from the Tuamotu Islands (Fangataufa) has been selected as holotype (MNHN Ga 1868). The other specimens are paratypes.

ETYMOLOGY. — The name refers to one of the Nereids of Greek mythology (Amathea).

DIAGNOSIS. — Carapace dorsally armed with 5-6 pairs of epigastric spines; parahepatic, hepatic, anterior branchial and postcervical spines present in most specimens. Short transverse median depression on intestinal region. Frontal margins almost transverse. Rostrum slightly curved. Supraocular spines reaching midlength of rostrum and not end of corneas. Anterolateral spine slightly longer than following spine. Branchial margins with five spines. Fifth to seventh thoracic sternites without lateral carinae. Second abdominal tergite with four pairs of spines and one transverse stria. Eyes large. Distomesial spine of antennular basal segment shorter than distolateral. Distal spine of basal antennal peduncle not overreaching the third segment. Distomesial spine of second antennal segment shorter than peduncle. Merus of third maxilliped with two marginal spines on flexor margin, extensor margin unarmed. Chelipeds and walking legs squamous, lacking epipods. Fixed finger of chelipeds armed with proximal spines. Dactylus of walking legs *c.* half propodus length.

DESCRIPTION (holotype)

Carapace slightly longer than wide. Transverse ridges mostly interrupted, with short, not iridescent setae. Main striae on posterior part of carapace interrupted in cardiac region. Secondary striae almost absent in branchial areas, only some scales between main striae. Small depression without striae or scales on intestinal region. Gastric region with one row of six pairs of epigastric spines, pair just behind supraocular spines being largest. Each hepatic region with one small spine near anterolateral angle. One parahepatic spine, one branchial anterior and one postcervical spine on each side.

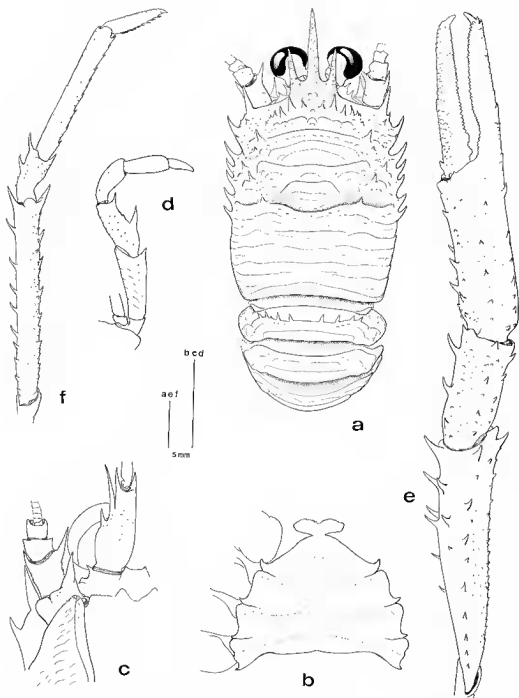


FIG. 5. — *Munida amathea* sp. nov. : a, carapace, dorsal view ; b, sternal plastron ; c, ventral view of cephalic region, showing antenna and antenna peduncles ; d, right third maxilliped, lateral view ; e, right cheliped, dorsal view ; f, right second pereiopod, lateral view. a, e, f : holotype, male 21 mm (MNHN Ga 1868) ; b, c, d : paratype, male 13.5 mm (MNHN Ga 1894).

Frontal margins nearly transverse. Lateral margins slightly convex. Anterolateral spine well developed, situated at anterolateral angle, almost reaching to the level of sinus between rostrum and supraocular spine. Second marginal spine before cervical groove slightly smaller than preceding one. Both spines with one basal spinule. Branchial margins with five spines decreasing in size posteriorly.

Rostrum slightly sinuous, horizontal, about half as long as remaining carapace. Supraocular spines reaching midlength of rostrum and nearly to end of corneas, slightly divergent and upwardly directed.

Fourth thoracic sternite with some very small arcuate striae; fifth to seventh sternites smooth. Transverse ridges between fifth, sixth and seventh sternites obtuse and granulated.

Second abdominal tergite with one row of four pairs of spines on anterior border. Second to fourth abdominal tergites each with one transverse continuous stria. Third and fourth segments each with one additional weak stria, situated anterior to main one and interrupted medially. Fifth segment with two uninterrupted striae.

Eyes large, maximum corneal diameter *c.* 1/3 the distance between bases of anterolateral spines.

Basal segment of antennule (distal spines excluded) elongate, one-quarter carapace length, overreaching corneas, with two distal spines, distomesial spine shorter than distolateral spine; and two lateral spines, proximal one short, located at midlength of segment, distal one long, overreaching distolateral spine.

First segment of antennal peduncle with strong distomesial spine, slightly overreaching second segment; second segment with two long distal spines, mesial longer than lateral, overreaching penultimate segment although not overreaching antennal peduncle; penultimate segment unarmed.

Ischium of third maxilliped 1.5 times length of merus, distoventrally bearing spine. Merus bearing two well developed ventral spines on flexor margin, distal smaller; extensor margin unarmed.

Chelipeds squamous, subequal, fingers slightly gaping, with numerous short setae, more dense on mesial borders of articles. Right cheliped nearly 4 times as long as carapace; merus slightly longer than carapace, twice as long as carpus and *c.* 1.5 times longer than palm; palm twice as long as high and nearly as long as fingers. Merus armed with four rows of spines. Carpus with several dorsal spines and some scattered spines on mesial and ventral sides. Palm with several spines scattered on mesial and dorsal sides and one dorsolateral row not extending along fixed finger. Movable finger with one mesial spine near its base. Fixed finger with one spine on proximal half. Fingers distally curving and crossing, fixed finger ending in a sharp point, with two distal spines; cutting edges with small teeth of various sizes.

Walking legs slender, furnished with long, plumose, not iridescent setae on dorsal margin and short, dense, setae on lateral borders. Second pereopod *c.* twice carapace length. Merus slightly shorter than carapace length, *c.* 9 times as long as high, slightly more than 3.5 times carpus length and 1.5 times as long as propodus; propodus 7.5 times as long as high and *c.* twice dactylus length. Merus with dorsal row of 10-11 spines, increasing in size distally, and with five spines on distal half of ventral margin, both distal spines prominent. Carpus with long distal spine on dorsal and ventral borders, one additional spine on dorsal margin. Propodus with ventral row of 11-12 spiniform setae. Dactylus with dorsal margin slightly convex on proximal half, feebly curving distally, with 11 spiniform setae along ventral margin. Third

pereiopod similar to second. Fourth pereiopod shorter than second and third, less spinulated. Merus of fourth pereiopod one-half times length of second pereiopod. Epipods absent from all pereiopods.

VARIATIONS. — The length of the supraocular spines is somewhat variable. In some specimens, as in the holotype, these spines reach the midlength of the rostrum, but not the end of the corneas. The number of epigastric spines is usually constant, although in several specimens only five pairs are present. The hepatic spine is absent in several individuals. The other important specific characters remain constant. The chelipeds in the females examined are slightly more than twice the length of the carapace, the merus being as long as the carapace, or slightly less; in males the length of the chelipeds is 3-4 times that of the carapace and the merus is always longer. The proximal spine on the lateral border of the fixed finger may be absent.

REMARKS. — *Munida amathea* is close to *M. rubrovata* and to *M. rubella* sp. nov. A comparison of the three species shows that they differ in several constant characters. The differences between *Munida amathea* and *M. rubrovata* are :

— the fixed finger of the chelipeds has a row of dorsolateral spines, extending on its whole length in *M. rubrovata*; whereas in *M. amathea*, only one proximal spine is present on this margin;

— the distomesial spine of the second antennal segment is long, always overreaching the antennal peduncle in *M. rubrovata*; the same spine is short and does not overreach the peduncle in *M. amathea*;

— there is only one stria on the second abdominal segment in *M. amathea*, but two in *M. rubrovata*.

Munida amathea is also close to *M. rubella* sp. nov., but they differ in several characters (see remarks under that species).

SIZE. — The males examined ranged between 13.5 and 25 mm, the females between 12.5 and 22 mm. Females are ovigerous from 18.5 mm.

DISTRIBUTION. — Tuamotu Islands (Fangataufa, Makemo, Marutea South, Mururoa, Gambier) and Tubuai Islands (Maria); depths between 300 and 500-800 m.

6. *Munida rubella* sp. nov.

(Fig. 6; pl. ID)

MATERIAL EXAMINED. — Society Islands, Tahiti/Vairao, 10.1978 (without position), trap : 1 ♀ 21 mm (MNHN Ga 1698). — Tuamotu Islands, Fangataufa, 21.02.1989, 22°12.9'S, 138°47.3'W, 700 m, trap : 1 ♂ 17 mm (MNHN Ga 1993); stn 323, 23.10.1990, 22°13.2'S, 138°42.7'W, 500 m, trap : 1 ♂ 18 mm, 1 ov. ♀ 20 mm, 1 ♀ 12.5 mm (MNHN Ga 1992); stn 326, 24.10.1990, 22°16.4'S, 138°43.8'W, 510 m, trap : 1

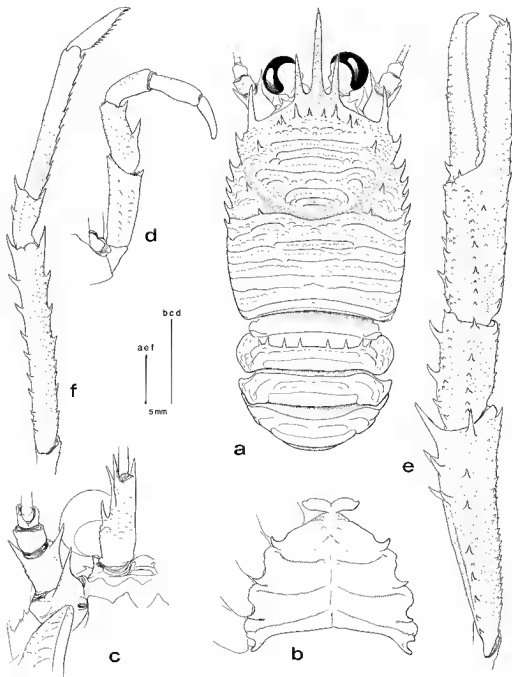


FIG. 6. — *Munda rubella* sp. nov. : a, carapace, dorsal view; b, sternal plastron; c, ventral view of cephalic region, showing antennula and antenna peduncles; d, right third maxilliped, lateral view; e right cheliped, dorsal view; f right second perciopod, lateral view; a, e, f: holotype, male 21.5 mm (MNHN Ga 1994); b, c, d: paratype, female 21 mm (MNHN Ga 1698).

♂ 21.5 mm (holotype, MNHN Ga 1994), 1 ♂ 26 mm (MNHN Ga 2026); Mururoa, 28.06.1988, 560-600 m, trap: 1 ♂ 22 mm (MNHN Ga 1991) - **Tubai Islands**, Rimitara, 03.09.1988, 500-700 m, trap: 1 ♂ 23 mm (MNHN Ga 1895).

TYPES. — One male (21.5 mm) from station 326, Tuamotu Islands (Fangataufa) has been selected as holotype (MNHN Ga 1994). The other specimens are paratypes.

ETYMOLOGY. — From the Latin *rubellus*, reddish, referring to the general colouration of the species.

DIAGNOSIS. — Carapace with numerous striae, dorsally armed with 5-6 pairs of epigastric spines; parahepatic, anterior branchial and postcervical spines present in most specimens. Without small median depression on intestinal region. Frontal margins nearly horizontal. Rostrum slightly curved and horizontal. Supraocular spines reaching midlength of rostrum and end of corneas. Anterolateral spine three times longer than following spine. Branchial margins with five spines. Lateral surface of fifth to seventh thoracic sternites without marked carinae. Second abdominal segment with four pairs of spines and two striae. Eyes large. Distomesial spine of antennular basal segment shorter than lateral. Distal spine of basal segment of antennal peduncle about as long as second antennal segment. Distomesial spine on second antennal segment shorter than antennal peduncle. Merus of third maxilliped with two spines on flexor margin, extensor margin unarmed. Chelipeds and walking legs squamous, lacking epipods. Fixed fingers of chelipeds armed with proximal spines. Dactylus of walking legs *c.* one-half propodus length.

DESCRIPTION (holotype)

Carapace slightly longer than wide. Transverse ridges mostly interrupted, with short, not iridescent setae. Main transverse striae on posterior part of carapace interrupted in cardiac region. Numerous small scales between main striae. No median depression on intestinal region. Gastric region with a row of five pairs of epigastric spines, pair just behind supraocular spines being the largest. One parahepatic, one branchial anterior and one postcervical spine on each side.

Frontal margins slightly oblique. Lateral margins feebly convex. Anterolateral spine well developed, situated at anterolateral angle, distinctly overreaching the level of sinus between rostrum and supraocular spines. Second marginal spine before cervical groove three times smaller than preceding one. Branchial margins with five spines decreasing in size posteriorly.

Rostrum spiniform, half as long as remaining carapace, slightly sinuous and horizontal. Supraocular spines reaching midlength of rostrum and end of corneas, slightly divergent, upwardly directed.

Fourth thoracic sternite with some short granulated striae; lateral surface of fifth to seventh sternites smooth, without granules or marked carinae. Transverse ridges between fifth, sixth and seventh sternites obtuse, feebly granulated.

Second abdominal tergite with one row of four pairs of spines on anterior border. Second tergite with two transverse striae, anterior stria weak and scaly, posterior one well marked and uninterrupted. Third and fourth abdominal tergites each with one transverse continuous stria and one additional weak stria interrupted medially and situated anterior to main one. Fifth tergite with two continuous striae.

Eyes large, maximum corneal diameter about one-third the distance between bases of anterolateral spines.

Basal segment of antennule (distal spines excluded) *c.* one quarter carapace length, elongate, overreaching corneas, with two distal spines, mesial spine shorter than lateral spine;

and two spines on lateral margin, proximal one short, located at midlength of segment, distal one long, not overreaching distolateral spine.

First segment of antennal peduncle with one strong distal spine on mesial margin ; second segment with two long distal spines, mesial spine longer than lateral spine, reaching end of penultimate segment, although not overreaching antennal peduncle ; penultimate segment unarmed.

Ischium of third maxilliped *c.* 1.5 times length of merus measured along dorsal margin, distoventrally bearing spine. Merus of third maxilliped bearing two well developed spines on flexor margin, distal smaller ; extensor margin unarmed.

Chelipeds subequal, squamous, with numerous setae more dense on mesial borders of articles. Right cheliped *c.* 3.5 times as long as carapace. Merus as long as carapace, slightly more than twice as long as carpus and nearly twice as long as palm ; palm slightly more than twice as long as high and nearly as long as fingers. Merus armed with four rows of spines. Carpus with several spines on dorsal side and several spines scattered on mesial and ventral sides. Palm with several spines scattered on mesial and dorsal sides and one row of dorsolateral spines, not continued onto fixed finger. Fingers distally curving and crossing, ending in a sharp point ; each with one lateral and one mesial spine near the base ; fixed finger with two spines near tip ; cutting edges with small teeth of different sizes.

Walking legs slender, furnished with long, plumose, not iridescent setae on dorsal margin and short, dense setae on lateral borders. Second pereiopod slightly more than twice carapace length ; merus as long as carapace, *c.* 7 times as long as high, *c.* 4 times carpus length and 1.5 times as long as propodus ; propodus *c.* 7.5 times as long as high, slightly more than twice dactylus length. Merus with one row of 10-11 spines on dorsal border, increasing in size distally, ventral margin with one long distal spine, one additional spine, and two projecting scales on distal half. Carpus with two or three dorsal spines and one distoventral spine. Propodus with 11-16 movable ventral spines. Dactylus with dorsal margin slightly convex on proximal half, slightly curving distally, with 10-11 movable spinules along ventral margin. Third pereiopod similar to second ; fourth pereiopod shorter than second and third. Merus of fourth pereiopod half length of second pereiopod. Epipods absent from all pereiopods.

Colour : Ground colour of carapace and abdominal segments orange, telson pinkish. Cervical groove whitish. Rostrum and spines on carapace and second abdominal segment red. Antennular and antennal peduncles red. Chelipeds and walking legs with transverse red and light orange bands. Fingers of chelipeds red, except for the proximal part light orange. Dactylus of walking legs red.

VARIATIONS. — The anterolateral spine on the carapace is always more than three times longer than the following spine (in one specimen four times). The postcervical spines may be absent. As in most species of *Munida* the number of secondary striae and scales on the carapace changes with size, being more numerous in larger individuals. All other important specific characters remain constant. The length of the chelipeds in the females examined is *c.* 2.5 times the carapace length, with the merus as long as the carapace. In males, the length of the chelipeds is more than 3.5 times the carapace length, the merus being as long or slightly longer than the carapace.

REMARKS. — *Munida rubella* is close to *M. amathea* sp. nov., however, they differ in several constant characters :

— *Munida amathea* has a small, median, smooth depression on the intestinal region, with the surface devoid of striae or scales ; in *M. rubella* there is a short stria at the same position ;
— the anterolateral spine, three or more times the size of the following spine, is very long in *M. rubella* ; the same spine is only slightly larger than the following one in *M. amathea*.

If specimens of similar sizes of the two species are compared, *M. rubella* shows a carapace clearly more squamous than *M. amathea* ; in the latter, the secondary striae and scales are practically absent at all sizes examined, whereas in *M. rubella* the secondary striae and scales are less numerous only in small specimens

SIZE. — The males examined ranged between 17 and 26 mm, the females between 12.5 and 21 mm. Ovigerous females from 20 mm.

DISTRIBUTION. — Society (Tahiti), Tuamotu (Mururoa, Fangataufa) and Tubuai (Rimatara) Islands. Depths between 500 and 700 m.

7. *Munida plexaura* sp. nov.

(Fig. 7 ; pl. IE)

MATERIAL EXAMINED. — Tuamotu Islands, Fakarava, stn D25, 07.06.1990, 16°07.33'S, 145°49.16'W, 398 m, dredge : 1 ♀ ov. 10 mm (holotype, MNHN Ga 1906) ; Mururoa (without position), 1984 : 1 ♂ 16 mm, 1 ♀ ov. 13.5 mm (MNHN Ga 1907). — Tubuai Islands, Raevavae, stn 344, 01.12.1990, 23°53.3'S, 147°36.1'W, 350 m, trap : 1 ♀ ov. 10 mm (MNHN Ga 2030)

TYPES. — One ovigerous female (10 mm) from the Tuamotu Islands (Fakarava) has been selected as holotype (MNHN Ga 1906). The other specimens are paratypes.

ETYMOLOGY. — The name refers to one of the Nereids of Greek mythology (Plexaura).

DIAGNOSIS. — Carapace with numerous striae, dorsally armed with 2-3 pairs of epigastric spines ; parahepatic and postcervical spines present. Frontal margins oblique. Rostrum slightly curved. Supraocular spines not reaching midlength of rostrum and end of corneas. Branchial margins armed with three spines. Lateral surface of fifth to seventh thoracic sternites without marked carinae. Second abdominal segment unarmed, with two transverse striae. Eyes large. Distal spines of antennular basal segment subequal in size. Distal spine of basal segment of antennal peduncle short, reaching a little over midlength of second segment. Merus of third maxilliped with 2-3 spines on flexor margin, extensor margin unarmed. Chelipeds and walking legs squamous, lacking epipods. Chelipeds with fixed and movable fingers armed with row of spines along dorsolateral and mesial margins, respectively, and several spines on dorsal border. Dactylus of walking legs c half propodus length.

DESCRIPTION (holotype)

Carapace slightly longer than wide. Transverse ridges mostly interrupted, with short, dense, not iridescent setae. Main transverse striae on posterior part of carapace interrupted in

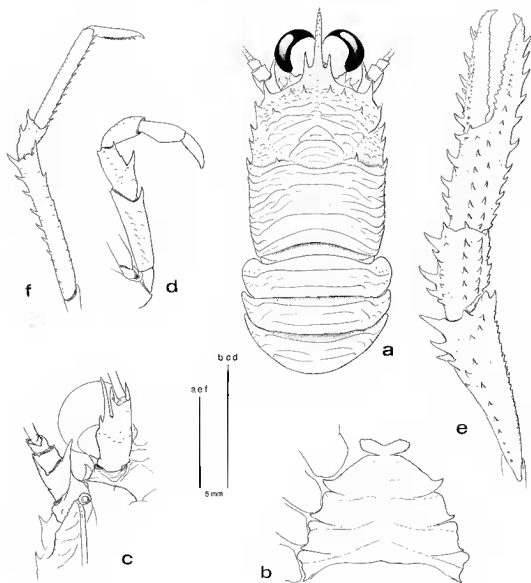


FIG. 7. — *Munida plexaura* sp. nov., holotype, female 10 mm (MNHN G_a 1906) : a, carapace, dorsal view ; b, sternal plastron ; c, ventral view of cephalic region, showing antennula and antenna peduncles ; d, right third maxilliped, lateral view ; e, right cheliped, dorsal view ; f, right second pereiopod, lateral view

cardiac region. Numerous secondary striae. Hepatic, gastric and anterobranchial regions squamous. Gastric region with one row of two pairs of epigastric spines, of similar size. One parahepatic and one postcervical spine on each side.

Frontal margins oblique. Lateral margins almost straight. Anterolateral spine short, not reaching to the level of sinus between rostrum and supraocular spines. Second marginal spine before cervical groove. Branchial margins with three spines of similar sizes.

Rostrum spiniform, half as long as remaining carapace, slightly sinuous and horizontal. Supraocular spines short, not reaching to midlength of rostrum and end of corneas, parallel and upwardly directed.

Fourth thoracic sternite with some short granulated striae; lateral surface of fifth to seventh sternites without marked carinae. Transverse ridges between fifth, sixth and seventh sternites obtuse, finely granulated.

Abdominal tergites unarmed. Second to fifth tergites each with two transverse striae. Anterior stria weak and interrupted medially on all tergites, posterior stria continuous on 2nd, 3rd and 5th tergites, interrupted medially on 4th.

Eyes large, maximum corneal diameter more than one-third the distance between bases of anterolateral spines.

Basal segment of antennule (distal spines excluded) *c.* one-quarter carapace length, elongate, although not overreaching corneas, with two long subequal distal spines; two spines on lateral margin, proximal one short, located at midlength of segment, laterodistal long, overreaching distal spines.

First segment of antennal peduncle with one strong short distal spine on mesial margin, not overreaching second segment; second segment with two long distal spines, mesial spine longer than lateral spine and reaching end of third segment; penultimate segment unarmed.

Ischium of third maxilliped *c.* twice length of merus, distoventrally bearing spine. Merus of third maxilliped bearing two spines on flexor margin, distal smaller; a small acute granule between these two spines. Extensor margin unarmed.

Chelipeds squamous, subequal, with numerous short setae, more dense on mesial borders of articles. Right cheliped *c.* 3 times as long as carapace. Merus slightly longer than carapace length, almost twice as long as carpus and *c.* twice as long as palm; palm *c.* 1.5 times longer than high and nearly as long as fingers. Merus armed with four rows of spines. Carpus with two rows of spines on dorsal side, several spines ranged in rows on mesial, lateral and ventral sides. Palm with one row of strong mesial spines, with some additional spines scattered on mesial border; two rows of small dorsal spines and one row of strong dorsolateral spines, continuing onto fixed finger and reaching tip. Movable finger with one row of strong mesial spines reaching tip. Both fingers with small dorsal spines on proximal half. Fingers distally curving and crossing, ending in a sharp point. Cutting edges with small teeth of various sizes.

Walking legs slender, furnished with long, plumose, iridescent setae on dorsal margin and with a few short setae on lateral borders. Second pereopod *c.* twice carapace length. Merus slightly shorter than carapace, slightly more than 7 times as long as high, nearly 4 times carpus length and 1.5 times as long as propodus; propodus 8 times longer than high and *c.* twice dactylus length. Merus with one row of 9-10 spines on dorsal border, increasing in size distally, ventral edge with one long distal spine and one additional spine and one projecting scale on distal half. Carpus with one long distal spine on dorsal and ventral borders, one additional dorsal spine. Propodus with one row of 12-13 movable spines on ventral margin. Dactylus

moderately long, its dorsal margin straight, slightly curving distally, with 9-10 movable spinules along ventral margin. Third pereopod similar to second, although slightly shorter. Fourth shorter, less spinulated than second and third. Merus of fourth pereopod 1/2 times that of second pereopod. Epipods absent from all pereopods.

Colour : Carapace with wide transverse yellow and purple bands. Epigastric region with a large purple spot, followed by a yellow band. A purple band along cervical groove, followed by a yellow band. A purple band situated on posterior part of carapace; posterolateral angles of carapace yellow. Second to fourth abdominal segments with a wide medial yellow spot, purple laterally. Fifth and sixth abdominal segments and telson whitish. Tip of the rostrum and frontal margins red. Colour of chelipeds and walking legs not clearly discernible on the colour transparency, although several bands are present, a dorsal red spot on anterior half of movable finger.

VARIATIONS. — In the male paratype there are three pairs of epigastric spines. The supraocular spines are convergent in one of the paratypes, where the merus of the third maxilliped has three ventral spines. The male of 16 mm has the chelipeds three times longer than the carapace, whereas in the ovigerous female of 13.5 mm the chelipeds are 2.5 times the carapace length.

REMARKS. — *Munida plexaura* is close to *M. evarne* sp. nov., however, they can be distinguished by several features (see remarks under that species).

Munida plexaura is also related to *M. sentai* Baba, 1986, from the Andaman Sea (BABA, 1986; 1988). However, they differ in several constant characters :

— in *Munida sentai* the hepatic region is furnished with several small spines and the anterior branchial region with spinous tubercles; in *M. plexaura* these spines and tubercles are absent;

— in the new species, the distomesial spine of the basal segment of the antennal peduncle is very short not reaching to the end of the second segment; in *M. sentai* this spine distinctly overreaches the second segment.

SIZE. — The male examined measured 16 mm, the ovigerous females ranged between 10 and 13.5 mm.

DISTRIBUTION. — Tuamotu (Fakarava, Mururoa) and Tubuai (Raevavae) Islands, 350-398 m depth.

8. *Munida lenticularis* sp. nov.

(Fig. 8; pl. IF)

MATERIAL EXAMINED. — Tuamotu Islands, Mururoa, 28.11.1989, 21°46.8'S, 138°52.1'W, 200 m, trap : 1 ♂ 11.5 mm (holotype MNHN Ga 1903), 1 ♂ 11.5 mm, 1 ♀ ov. 11 mm (paratypes, MNHN Ga 1904).

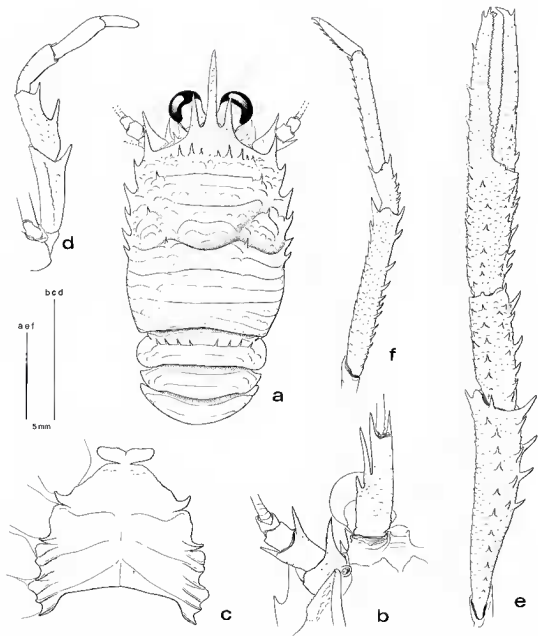


FIG. 8. — *Munida lenticularis* sp. nov., holotype, male 11.5 mm (MNHN Ga 1903) : a, carapace, dorsal view ; b, sternal plastron ; c, ventral view of cephalic region, showing antennula and antenna peduncles ; d, right third maxilliped, lateral view ; e, right cheliped, dorsal view ; f, right second pereopod, lateral view.

ETYMOLOGY. — From the Latin *lenticula*, dark, freckle, in reference to the two round spots on anterior branchial regions.

DIAGNOSIS. — Carapace dorsally armed with 8-9 epigastric spines; parahepatic, anterior branchial and postcervical spines present. Frontal margins slightly oblique. Rostrum slightly curved. Supraocular spines reaching to midlength of rostrum and end of corneas. Branchial margins with four spines. Lateral surface of fifth to seventh thoracic sternites with marked carinae. Second abdominal tergite with four pairs of spines and one transverse stria. Eyes small. Distal spines of antennular basal segment subequal in size. Distal spine of basal antennal peduncle slightly overreaching second segment of antennal peduncle. Merus of third maxilliped with two marginal spines on flexor margin, extensor margin unarmed. Chelipeds and walking legs squamous, lacking epipods. Fixed fingers of chelipeds armed with one row of spines along lateral border, movable finger with several spines on proximal half. Dactylus of walking legs about half length of propodus.

DESCRIPTION (holotype)

Carapace slightly longer than wide. Transverse ridges mostly interrupted, with short, not iridescent setae. Main transverse striae on posterior part of carapace interrupted in cardiac region. Secondary striae almost absent in branchial regions. Gastric region with one row of nine epigastric spines, largest pair just behind supraocular spines. One parahepatic, one anterior branchial and one postcervical spine on each side.

Frontal margins slightly oblique. Lateral margins slightly convex. Anterolateral spine well developed, situated at anterolateral angle, not reaching to the level of sinus between rostrum and supraocular spines. Second marginal spine before cervical groove smaller than preceding one. Branchial margins with four spines decreasing in size posteriorly.

Rostrum horizontal, slightly sinuous, half as long as remaining carapace. Supraocular spines reaching midlength of rostrum and end of corneas, subparallel, and slightly directed upwards.

Fourth thoracic sternite with a few short granulated striae; fifth to seventh sternites with short distinct carinae on lateral surfaces, without striae or granules. Transverse ridges between fifth, sixth and seventh sternites obtuse.

Second abdominal tergite with one row of four pairs of spines on anterior border. Second and third abdominal tergites with one transverse continuous stria. Fourth and fifth tergites with one weak stria interrupted medially.

Eyes small, maximum corneal diameter about one-quarter the distance between bases of anterolateral spines.

Basal segment of antennule (distal spines excluded), *c.* one-third carapace length, elongate, clearly overreaching corneas, with two long subequal distal spines; and two spines on lateral margin, proximal one short, located at midlength of segment, distolateral long, not overreaching distal spines.

First segment of antennal peduncle with one strong spine on mesial margin, slightly overreaching second segment; second segment with two long distal spines, reaching end of penultimate segment; penultimate segment unarmed.

Ischium of third maxilliped *c.* 1.5 times length of merus measured along extensor margin, distoventrally bearing spine. Merus bearing two well developed spines on flexor margin, distal smaller. Extensor margin unarmed.

Chelipeds squamous, right cheliped longer and stouter than left, with numerous short setae, more dense on mesial borders of articles. Right cheliped 3.5 times (left 3.2 times) as long as carapace. Merus slightly longer than carapace length, 1.5 times longer than carpus and c. 1.5 times longer than palm; palm c. 1.5 times as long as high and as long as fingers. Merus of right cheliped armed with four rows of spines. Carpus with several spines scattered on dorsal, mesial and ventral sides. Palm with two rows of mesial spines, one row of dorsal spines and one row of lateral spines, continuing on the whole length of fixed finger. Fingers distally curving and crossing, with a distal spine, ending in sharp point. Movable finger with one mesial spine near its base and three spines on proximal half of dorso-mesial margin. Cutting edges with small teeth of different sizes. Right cheliped strongly gaping

Walking legs slender, furnished with long, plumose, non iridescent setae on dorsal margin and some setae scattered on lateral sides. Second pereopod twice carapace length. Merus of second pereopod as long as carapace, 6 times as long as high, 4 times carpus length and 1.5 times as long as propodus; propodus slightly more than 7 times as long as high and twice dactylus length. Merus with one row of 12-13 spines on dorsal border, one distal spine and one additional spine on ventral margin, distal spines both prominent. Carpus with long distal spine on dorsal and ventral borders, and four additional dorsal spines. Propodus with one row of ten movable ventral spines. Dactylus with dorsal margin slightly convex on proximal half, slightly curving distally, with 7-8 movable spinules along ventral margin. Third pereopod similar to second, although slightly shorter. Fourth pereopod shorter than second and third, less spinulated. Merus of fourth pereopod c. $\frac{3}{4}$ length of second pereopod. Epipods absent from all pereopods.

Colour : Body red, with several transverse white bands on carapace and abdominal segments. A white spot on epigastric region behind rostrum and another spot on each hepatic region, near carapace margin. A round red spot, encircled by white, on each anterior branchial region. Rostrum and spines on carapace reddish. Chelipeds with whitish and red bands. Distal half of fingers white. Tip of dactylus of walking legs red.

VARIATIONS. — No significant variations have been observed in the specimens examined. The female paratype has the chelipeds about three times longer than the carapace.

REMARKS. — This species somewhat resembles *M. pasithea* sp. nov., but it differs in the following aspects :

- the frontal margins are clearly more oblique in *M. pasithea*;
- the distal spines of the basal antennular segment are short in *M. pasithea* whereas in *M. lenticularis* these spines are well developed;
- the movable fingers of the chelipeds, in *M. pasithea*, have a row of spines on the whole length of the mesial border; in *M. lenticularis*, these spines are limited to the proximal half of the finger;
- the dactyli of the walking legs are more slender in *M. lenticularis*, being about half the length of the propodus; in *M. pasithea*, the dactyli are more elongate and only slightly shorter than the propodi.

Munida lenticularis is also close to *M. ocellata* sp. nov., but they differ in the following aspects :

— the basal segment of the antennular peduncle has two long subequal distal spines in *M. lenticularis*, whereas in *M. ocellata* the distomesial spine is shorter than the distolateral spine ;

— the chelipeds are different : in *M. ocellata* the palm is more setose, the setae covering entirely the palm, specially in larger males ; in *M. lenticularis*, the palm is moderately setose, the setae being dense only on the mesial border ;

— the fixed finger of the chelipeds, in *M. lenticularis*, has one row of spines along its lateral border whereas in *M. ocellata*, the spines are limited to the proximal half of the finger. The movable finger has only one proximal spine in *M. ocellata*, whereas there is a dorsomesial row of 3-4 spines in *M. lenticularis*.

SIZE. — The males examined measured 11.5 mm, the ovigerous female 11 mm.

DISTRIBUTION. — Tuamotu (Mururoa) Islands, 200 m depth.

9. *Munida ocellata* sp. nov.

(Fig. 9 ; pl. IG, H)

MATERIAL EXAMINED. — Society Islands, Raiatea, stn D31, 21.06.1990, 16°41.66'S, 151°26.34'W, 280 m, dredge : 1 ♂ 9.5 mm (MNHN Ga 1912). — Tuamotu Islands, Akiaki, 10.06.1989, 18°32'S, 139°12'W, 250-300 m, trap : 3 ♂ 11-11.5 mm (MNHN Ga 1913) ; Gambier, 14.06.1989, 23°00.6'S, 134°58.6'W, 300 m, trap : 4 ♂ 8.5-12 mm (MNHN Ga 1911) ; Gambier, Acteons Maria, stn 241, 30.05.1990, 22°00.9'S, 136°12.5'W, 380 m, trap : 1 ♂ 13.5 mm (holotype MNHN Ga 1909), 11 ♂ 10.5 to 12.5 mm, 4 ♀ ov. 9 to 10.5 mm, 2 ♀ 10.5 and 11 mm (MNHN Ga 1910) ; Mururoa, 28.11.1989, 21°46.8'S, 138° 52.1'W, 200 m, trap : 3 ♂ 10.5 to 12 mm (MNHN Ga 2025) ; Mururoa (without position), 1984 : 2 ♂ 6.5 and 9.5 mm, 1 ♀ ov. 7.5 mm (MNHN Ga 1914) ; Y. PLESSIS coll., 1 mile offshore, trap : 1 ♂ 13 mm, 1 ov. ♀ 8.5 mm (MNHN Ga 1915). — Tubuai Islands (Îles Australes), Raevavae, stn 344, 01.12.1990, 23°53.3'S, 147°36.1'W, 350 m, trap : 2 ov. ♀ 9 and 10.5 mm (MNHN Ga 2028) ; Maria, stn 353, 08.12.1990, 21°47.6'S, 154°42.1'W, 310 m trap : 3 ♂ 9 to 11 mm ; 1 ov. ♀ 6 mm (MNHN Ga 2029).

TYPES. — One male (13.5 mm) from the Tuamotu Islands (Gambier, Acteons Maria) has been selected as holotype (MNHN Ga 1909). The other specimens are paratypes.

ETYMOLOGY. — From the Latin *ocellus* in reference to the spots on the anterior branchial regions.

DIAGNOSIS. — Carapace dorsally armed with 4-5 pairs of epigastric spines ; parahepatic, anterior branchial and postcervical spines present. Frontal margins moderately oblique. Rostrum slightly curved. Supraocular spines slightly overreaching midlength of rostrum and end of corneas. Branchial margins with four spines. Fifth to seventh sternites with short marked carinae on lateral surfaces. Second abdominal segment with four pairs of spines and one transverse stria. Eyes small. Mesiodistal spine of antennular basal segment shorter than lateral. Distal spine of basal segment of antennal peduncle overreaching second segment. Merus of third maxilliped with two spines on flexor margin extensor margin unarmed. Chelipeds and walking legs squamous, lacking epipods. Chelipeds with fixed and movable fingers armed with spines only on first half. Dactylus of walking legs less than half propodus length.

DESCRIPTION (holotype)

Carapace slightly longer than wide. Transverse ridges mostly interrupted, with short and dense setae, and some long setae scattered on carapace. Setae not iridescent. Main transverse

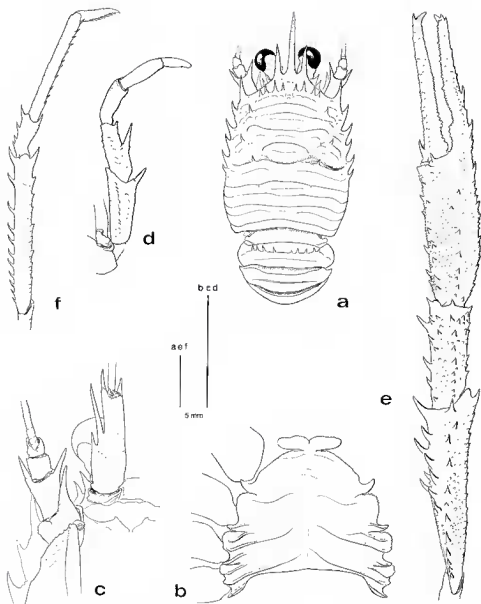


FIG. 9. — *Munida ocellata* sp. nov., holotype, male 13.5 mm (MNHN Ga 1909) : a, carapace, dorsal view ; b, sternal plastron ; c, ventral view of cephalic region, showing antennula and antenna peduncles, d, right third maxilliped, lateral view ; e, right cheliped, dorsal view ; f, right second pereopod, lateral view.

striae on posterior part of carapace interrupted in cardiac region. Secondary striae absent, only some scales between main striae. Gastric region with row of four pairs of epigastric spines, largest pair just behind supraocular spines. One parahepatic, one anterior branchial, and one postcervical spine on each side.

Frontal margins oblique. Lateral margins slightly convex. Anterolateral spine well developed situated at anterolateral angle, almost reaching to the level of sinus between rostrum and supraocular spines. Second marginal spine before cervical groove smaller than preceding one. Branchial margins with four spines decreasing in size posteriorly.

Rostrum horizontal, slightly curved upwards, half as long as remaining carapace. Supraocular spines reaching midlength of rostrum and end of corneas, subparallel and slightly upwardly directed.

Fourth thoracic sternite with few short granulated striae; fifth to seventh sternites with short marked carinae on lateral surfaces, without striae and granules. Transverse ridges between fifth, sixth and seventh sternites obtuse.

Second abdominal tergite with one row of nine spines on anterior border. Second and third abdominal tergites with one transverse continuous stria. Fourth and fifth tergites without striae.

Eyes small, maximum corneal diameter *c.* 1/4 the distance between bases of anterolateral spines.

Basal segment of antennule (distal spines excluded) *c.* 1/3 carapace length, elongate, clearly overreaching corneas, with two distal spines, mesial spine shorter than lateral spine; and two spines on lateral margin, proximal one short, located at midlength of segment, distal one long, not overreaching distolateral spine.

First segment of antennal peduncle with one strong slightly curved spine on mesial margin overreaching second segment; second segment with two long distal spines, overreaching penultimate segment, although not overreaching antennal peduncle; penultimate segment unarmed.

Ischium of third maxilliped *c.* 1.5 times length of merus, distoventrally bearing spine. Merus bearing two spines on flexor margin, distal clearly smaller. Extensor margin unarmed.

Chelipeds squamous, subequal, slightly gaping, with numerous short setae more dense on mesial borders of articles. Palm fully covered by dense setae. Right cheliped *c.* 3.8 times as long as carapace. Merus slightly longer than carapace, *c.* 1.5 times longer than carpus and 1.5 times longer than palm; palm nearly twice as long as high and nearly as long as fingers. Merus armed with four rows of spines. Carpus with several spines scattered on dorsal, mesial and ventral sides. Palm with two rows of mesial spines, one row of dorsal spines and one row of dorsolateral spines continuing onto proximal half of fixed finger. Movable finger with one proximal mesial spine. Fixed finger with two distal spines. Fingers slender, distally curving and crossing, ending in a sharp point, with one additional distal spine on movable finger and two on fixed finger. Cutting edges with small teeth of different sizes.

Walking legs slender, furnished with long, plumose setae, some of them iridescent, on dorsal margin and some short setae on lateral sides. Second pereiopod slightly more than twice carapace length. Merus as long as carapace, nearly 10 times as long as high, 3.5 times carpus length and *c.* 1.5 times as long as propodus; propodus *c.* 11 times as long as high and *c.* 2.5 times dactylus length. Merus with row of 11-12 spines on dorsal border, increasing in size distally, one distal spine on ventral margin, both distal spines prominent. Carpus with long

distal spine on dorsal and ventral borders, three additional spines on dorsal margin. Propodus with row of 11-13 movable spines on ventral margin. Dactylus slightly curving distally, with 7-8 movable spinules along ventral margin. Third pereopod similar to first, although slightly shorter. Fourth pereopod shorter than second and third and less spinulated. Merus of fourth pereopod *c.* half length of second pereopod. Epipods absent from all pereopods.

Colour : Carapace with wide transverse yellow-orange and light purple bands. Yellow-orange bands situated on mesogastric and antero-cardiac area and on posterior part of carapace. Each anterobranchial region with a yellow-orange spot, red on its posterior border and circled by whitish. Ground colour of chelipeds and walking legs orange. Distal part of palm reddish. Fingers with proximal third whitish.

VARIATIONS. — Several specimens have five pairs of epigastric spines and the fourth abdominal tergite smooth, without striae. The females examined have the chelipeds clearly less setose than the males, with the fingers longer than the palm. This difference is especially clear comparing females and males over 10 mm carapace length. On the other hand, the small males and the females have shorter chelipeds *c.* 3.1-3.3 times the carapace length and the palm about 2.7 times as long as high.

REMARKS. — This new species is closely related to *M. polynoe* sp. nov., however they may be easily distinguished by the following characters :

— the branchiolateral margins always have four spines in *M. ocellata*, but only three spines in *M. polynoe* ;

— in *M. ocellata* the fixed finger of the chelipeds have 2-3 spines on the proximal half of the dorso-lateral border ; in *M. polynoe* these spines are absent ;

— comparing specimens of similar size and sex, the chelipeds are clearly longer in *M. polynoe* : in *M. polynoe* the chelipeds are more than 4 times the carapace length, whereas in *M. ocellata* this ratio is at most 3,8 ;

— the basal segment of the antennular peduncle is more than one-third the carapace length in *M. polynoe*, whereas in *M. ocellata* this segment is less than one-third the carapace length ; on the other hand, the distal spines of this basal segment are short in *M. polynoe*, whereas in *M. ocellata* these spines are well developed.

Munida ocellata is also very close to *M. pulchra* sp. nov. (see remarks under that species).

SIZE. — The males examined ranged between 6.5 and 13.5 mm, females between 6 and 11 mm. Oviparous females from 6 mm.

DISTRIBUTION. — Society (Raiatea), Tubuai (Raevavae, Maria) and Tuamotu (Akiaki, Gambier-Acteons Maria, Mururoa) Islands. Depths between 200 and 380 m.

10. *Munida pulchra* sp. nov.

(Fig. 10)

MATERIAL EXAMINED. — **Tubuai Islands**, Rurutu, stn 341, 28.11.1990, 22°26.5'S, 151°23.1'W, 300 m, trap : 1 ov. ♀ 7.5 mm (holotype, MNHN Ga 2031).

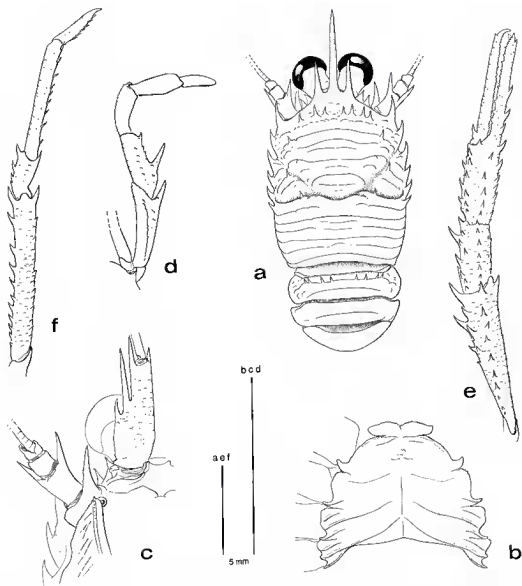


FIG. 10. — *Munida pulchra* sp. nov., holotype, female 7.5 mm (MNHN Ga 2031): a, carapace, dorsal view; b, sternal plastron; c, ventral view of cephalic region, showing antennula and antenna peduncles; d, right third maxilliped, lateral view; e, right cheliped, dorsal view; f, right second pereopod, lateral view.

ETYMOLOGY. — From the Latin *pulcher*, pretty, in reference to the nice colouration of the species.

DIAGNOSIS. — Carapace dorsally armed with four pairs of epigastric spines; parahepatic, anterior branchial and postcervical spines present. Frontal margins oblique. Rostrum slightly curved. Supraocular spines not quite reaching to midlength of rostrum and end of corneas. Branchial margins with four spines. Fifth to seventh thoracic sternites with short marked carinae on lateral surfaces. Second abdominal tergite with four pairs of spines and one transverse stria. Eyes large. Mesiodistal spine of antennular basal segment shorter than lateral. Distal spine of basal antennal peduncle overreaching second segment of antennal peduncle. Merus of third maxilliped with two spines on flexor margin, extensor margin unarmed. Chelipeds and walking legs squamous, lacking epipods. Fingers of chelipeds armed with spines only on the proximal half. Dactylus of walking legs less than half propodus length.

DESCRIPTION (holotype)

Carapace slightly longer than wide. Transverse ridges mostly interrupted, with some setae scattered on carapace. Main transverse striae on posterior part of carapace interrupted in cardiac region. Secondary striae absent, only some scales between main striae. Gastric region with one row of seven epigastric spines, largest pair just behind supraocular spines. One parahepatic, one branchial anterior and one postcervical spine on each side.

Frontal margins oblique. Lateral margins slightly convex. Anterolateral spine well developed, situated at anterolateral angle, almost reaching to the level of sinus between rostrum and supraocular spines. Second marginal spine before cervical groove somewhat smaller than preceding one. Branchial margins with four spines decreasing in size posteriorly.

Rostrum horizontal, slightly sigmoid, half as long as remaining carapace. Supraocular spines reaching to midlength of rostrum and end of corneas, subparallel, slightly directed upwards.

Fourth thoracic sternite with a few short granulated striae; fifth to seventh sternites with short marked carinae on lateral surfaces, without striae or granules. Transverse ridges between fifth, sixth and seventh sternites obtuse.

Second abdominal tergite with one row of four pairs of spines on anterior border. Second and third abdominal tergites with one transverse continuous stria. Fourth and fifth tergites smooth.

Eyes moderately large, maximum corneal diameter more than one-third the distance between bases of anterolateral spines.

Basal segment of antennule (distal spines excluded) *c.* one-third carapace length, elongate, clearly overreaching corneas, with two distal spines, mesial spine shorter than lateral one; and two spines on lateral margin, proximal one short, located at midlength of segment, distolateral one long, but not overreaching distolateral spine.

First segment of antennal peduncle with one strong slightly curved spine on mesial margin, overreaching second segment; second segment with two long distal spines, overreaching penultimate segment, although not overreaching antennal peduncle; penultimate segment unarmed.

Ischium of third maxilliped *c.* 1.5 times length of merus, distoventrally bearing spine. Merus bearing two spines on flexor margin, distal clearly smaller. Extensor margin unarmed.

Chelipeds squamous, subequal, fingers slightly gaping, with numerous short setae more dense on mesial borders of articles. Palm fully covered by dense setae. Right cheliped *c.* 3 times as long as carapace. Merus as long as carapace, *c.* twice as long as carpus and twice as long

as palm; palm 2.5 times as long as high and two-thirds length of fingers. Merus armed with four rows of spines. Carpus with several spines scattered on dorsal, mesial and ventral sides. Palm with two rows of mesial spines, one row of dorsal spines and one row of dorsolateral spines continuing along fixed finger, although not reaching beyond proximal half. Movable finger with one mesial spine near its base. Fixed finger with two spines near tip. Fingers slender, distally curving and crossing, ending in sharp point, with additional distal spine on movable finger and two on fixed finger. Cutting edges with small teeth of different sizes.

Walking legs slender, furnished with long, plumose setae (some of them iridescent) on dorsal margin, and some short setae on lateral borders. Second pereopod slightly more than twice carapace length. Merus as long as carapace, nearly 6 times as long as high, 3.5 times carpus length and *c.* 1.5 times as long as propodus; propodus *c.* 6 times as long as high and *c.* twice dactylus length. Merus with one dorsal row of 10-11 spines, increasing in size distally and with one ventral distal spine; distal spines prominent. Carpus with long dorsal and ventral distal spines, and with three additional spines on dorsal margin. Propodus with one row of 10-11 movable ventral spines. Dactylus slightly curving distally, with 7-8 movable spinules along ventral margin. Third pereopod similar to first, although slightly shorter. Fourth pereopod shorter than second and third, less spinulated. Merus of fourth pereopod about half length of second pereopod. Epipods absent from all pereopods.

REMARKS. — This new species is very close to *M. ocellata* sp. nov. from which it differs mainly by the colour pattern.

The only morphological character that distinguishes the only known specimen of *M. pulchra* from the numerous *M. ocellata* in the collection is relative to the size of the corneas: the maximum carneal diameter is more than 1/3 the length of the anterior border of the carapace between the bases of the anterolateral spines. In *M. ocellata*, this ratio is about 1/4.

Although *M. pulchra* is a brilliantly coloured species (the only colour photograph has been unfortunately lost, so that this colouration cannot be described), it lacks the yellow-orange spots, circled with white, on the anterobranchial regions which are characteristic of *M. ocellata*.

DISTRIBUTION. — Tubuai (Rurutu), 300 m depth

11. *Munida longicheles* sp. nov.

(Fig. 11; pl. II)

MATERIAL EXAMINED. — Tuamotu Islands, Mururoa, stn D53, 17.10.1990, 21°51.45'S, 139°01.98'W, 439 m, dredge: 1 ♂ 8 mm (holotype, MNHN Ga 1998).

ETYMOLOGY. — The name refers to the chelipeds which are very long in this species.

DIAGNOSIS. — Carapace dorsally armed with four pairs of epigastric spines; parahepatic, anterobranchial and postcervical spines present. Frontal margins slightly oblique. Rostrum straight. Supraocular spines reaching to midlength of rostrum and not end of corneas. Branchial margins with 3-4 spines. Fifth to seventh thoracic sternites with short marked carinae on lateral surfaces. Second abdominal tergite with two pairs of spines and one transverse stria. Eyes moderately large. Mesiodistal spine of

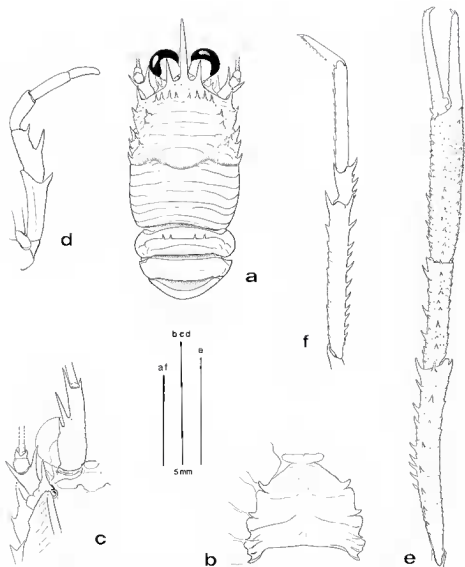


FIG. 11. — *Munida longicheles* sp. nov., holotype, male 8 mm (MNHN Ga 1998) : a, carapace, dorsal view ; b, sternal plastron ; c, ventral view of cephalic region, showing antennula and antenna peduncles ; d, right third maxilliped, lateral view ; e, right cheliped, dorsal view ; f, right second pereopod, lateral view.

PLANCHE 1 — A, *Munida hystrix* sp. nov., mâle 13.5 mm, paratype (MNHN Ga 1918). B, *Munida profunda* sp. nov., ovigerous female 17 mm, holotype (MNHN Ga 1997). C, *Munida rubrovata* sp. nov., ovigerous female 12.5 mm, paratype (MNHN Ga 1901). D, *Munida rubella* sp. nov., female 12 mm, paratype (MNHN Ga 1992). E, *Munida plexaura* sp. nov., ovigerous female 10 mm, holotype (MNHN Ga 1906). F, *Munida lenticularis* sp. nov., mâle 11.5 mm, paratype (MNHN Ga 1904). G, *Munida ocellata* sp. nov., ovigerous female 9 mm, paratype (MNHN Ga 1910). H, *Munida ocellata* sp. nov., ovigerous female 10.5 mm, paratype (MNHN Ga 1910). I, *Munida longicheles* sp. nov., mâle 8 mm, holotype (MNHN Ga 1998).



antennular basal segment clearly shorter than lateral. Distal spine of basal antennal peduncle slightly overreaching second segment of antennal peduncle. Merus of third maxilliped with two spines on flexor margin; extensor margin unarmed. Chelipeds and walking legs squamous, lacking epipods. Chelipeds with fingers almost unarmed. Propodus of second pereiopods more than twice dactylus length.

DESCRIPTION (holotype)

Carapace slightly longer than wide. Transverse ridges mostly interrupted, with short, not iridescent setae. Main transverse striae on posterior part of carapace interrupted in cardiac region. Secondary striae almost absent. Gastric region with one row of four pairs of epigastric spines, second and third pairs the largest, subequal. Two parahepatic spines on each side. Two spines on each anterior branchial region. One small postcervical spine on each side.

Frontal margins slightly oblique. Lateral margins slightly convex. Anterolateral spine well developed, situated at anterolateral angle, not reaching to the level of sinus between rostrum and supraocular spines. Second marginal spine before cervical groove smaller than preceding one. Right branchial margins with three spines of similar size. Left branchial margin with four spines, third spine smaller.

Rostrum straight, horizontal, *c.* half as long as remaining carapace. Supraocular spines reaching midlength of rostrum, and not end of corneas, subparallel and upwardly directed.

Fourth thoracic sternite smooth, without granulated striae; fifth to seventh sternites with short, sharp carinae on lateral surfaces, without striae or granules. Transverse ridges between fifth, sixth and seventh sternites obtuse.

Second abdominal tergite with one row of two pairs of spines on anterior border. Second and third abdominal tergites with one transverse continuous stria. Fourth and fifth tergites smooth.

Eyes moderately large, maximum corneal diameter slightly more than 1/3 the distance between bases of anterolateral spines.

Basal segment of antennule (distal spines excluded) 1/3 carapace length, elongate, clearly reaching beyond corneas, with two distal spines, mesial spine very small, much shorter than lateral spine; and two spines on lateral margin, proximal one short, located at midlength of segment, lateral one long but not overreaching distolateral spine.

First segment of antennal peduncle with strong distal spine on mesial margin, slightly overreaching second segment; second segment with two long distal spines, mesial spine longer than lateral spine, overreaching antennal peduncle; penultimate segment unarmed.

Ischium of third maxilliped *c.* 1.5 times length of merus, distoventrally bearing spine. Merus bearing two spines on flexor margin, proximal well developed, distal small. Extensor margin unarmed.

Chelipeds moderately squamous, not gaping, subequal in length; left cheliped slightly stouter than right; short setae on mesial, dorsal and lateral borders of articles, more dense on palm. Cheliped *c.* 5 times carapace length. Merus *c.* 1.5 times carapace length, slightly longer than carpus and palm; palm 4 times longer than high, slightly longer than fingers. Merus armed with four rows of spines. Carpus with several spines scattered on dorsal, mesial and ventral sides. Palm with several spines scattered on mesial and dorsal sides, one row of dorsolateral spines, not continuing along fixed finger. Movable finger with one mesial spine

near its base. Fingers distally curving and crossing, ending in sharp point, with two spines near tips. Cutting edges with small teeth of different sizes.

Walking legs slender, furnished with several long, plumose, iridescent setae on dorsal margins and with some short setae on lateral borders. Second pereiopod *c.* 2.5 times carapace length. Merus slightly longer than carapace, nearly 7 times as long as high, *c.* 4.5 times carpus length and 1.5 times as long as propodus; propodus *c.* 10 times as long as high and less than twice dactylus length. Merus with one dorsal row of 11-13 spines, increasing in size distally, and with one distoventral spine, distal spines prominent. Carpus with long dorsal and ventral distal spines and 3-4 additional spines on dorsal margin. Propodus with one row of nine movable ventral spines. Dactylus with dorsal margin straight, slightly curving distally, with eight movable ventral spinules. Third pereiopod similar to second. Merus of fourth pereiopod half as long as that of second pereiopod. Epipods absent from all pereiopods.

Colour : Ground colour of carapace and abdomen light orange; rostrum, frontal margins, and striae dark orange. Chelipeds and walking legs light orange. Chelipeds with median red band on fingers, distal part of fingers whitish. Walking legs with red band on terminal part of carpus and propodus.

REMARKS. — *Munida longicheles* is closely related to *M. polynoe* sp. nov., but they can be distinguished by several characters :

— the eyes are slightly more than 1/3 the distance between anterolateral spines in *M. longicheles*; they are about 1/4 that distance in *M. polynoe*;

— the anterolateral spines do not reach the sinus between rostrum and supraocular spines in *M. longicheles*; in *M. polynoe*, the anterolateral spines distinctly overreach that sinus;

— the propodus of the second pereiopods is less than twice the dactylus length in *M. longicheles*, whereas in *M. polynoe* it is more than twice that length.

Munida rufiantennulata Baba, 1969 (BABA, 1969, 1988) from Japan and the Philippines is also related to *M. longicheles*. Both species can be distinguished by small but constant differences :

— the mesial spine of the second segment of the antennal peduncle is very long in *M. longicheles*, reaching beyond the antennal peduncle. In *M. rufiantennulata* this spine never overreaches the antennal peduncle;

— the distal half of the fingers is reddish in *M. rufiantennulata*, whitish in the new species.

DISTRIBUTION. — Tuamotu (Mururoa) Islands, 439 m depth.

12. *Munida polynoe* sp. nov.

(Fig. 12)

MATERIAL EXAMINED. — Tuamotu Islands, Fakarava, stn D25, 07.06.1990, 16°07.33'S, 145°49.16'W, 398 m, trap : 1 ♂ 9.5 mm (holotype, MNHN Ga 1987), 1 ♂ 8 mm (paratype, MNHN Ga 1988).

ETYMOLOGY. — The name refers to one of the Nereids of the Greek mythology (Polynoe).

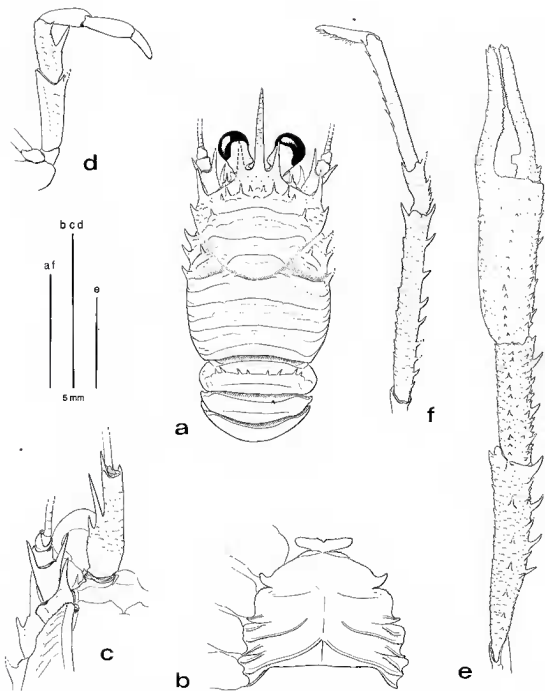


FIG. 12. — *Munida polynoe* sp. nov., holotype, male 9.5 mm (MNHN Ga 1987) : a, carapace, dorsal view ; b, sternal plastron ; c, ventral view of cephalic region, showing antennula and antenna peduncles ; d, right third maxilliped, lateral view ; e, left cheliped, dorsal view ; f, left second pereiopod, lateral view.

DIAGNOSIS. — Carapace dorsally armed with 3-4 pairs of epigastric spines; parahepatic and anterior branchial spines present. Frontal margins slightly oblique. Rostrum straight. Supraocular spines reaching to midlength of rostrum and not end of corneas. Branchial margins with three spines. Fifth to seventh thoracic sternites with short distinct carinae on lateral surfaces. Second abdominal tergite with 2-4 pairs of spines and one transverse stria. Eyes small. Mesiodistal spine of antennular basal segment clearly shorter than lateral. Distal spine of basal antennal peduncle slightly overreaching second segment of antennal peduncle. Merus of third maxilliped with two spines on flexor margin; extensor margin unarmed. Chelipeds and walking legs squamous, lacking epipods. Basal spine on movable finger. Propodus of second pereopods more than twice dactylus length.

DESCRIPTION (holotype)

Carapace slightly longer than wide. Transverse ridges mostly interrupted, with short, non iridescent setae. Main transverse striae on posterior part of carapace interrupted in cardiac region. Secondary striae almost absent. Gastric region with one row of four pairs of epigastric spines, second and third pair largest, subequal. One parahepatic and one branchial anterior spine on each side.

Frontal margins slightly oblique. Lateral margins slightly convex. Anterolateral spine well developed, situated at anterolateral angle, reaching to the level sinus between rostrum and supraocular spines. Second marginal spine before cervical groove smaller than preceding one. Branchial margins with three spines decreasing in size posteriorly.

Rostrum straight, horizontal, half as long as remaining carapace. Supraocular spines reaching to midlength of rostrum, but not to end of corneas, slightly divergent and upwardly directed.

Fourth thoracic sternite smooth, without granulated striae; fifth to seventh sternites with short marked carinae on lateral surfaces, without striae or granules. Transverse ridges between fifth, sixth and seventh sternites obtuse.

Second abdominal tergite with one row of four pairs of spines on anterior border. Second and third abdominal tergites with one transverse continuous stria. Fourth and fifth tergites smooth.

Eyes small, maximum corneal diameter clearly less than 1/3 the distance between bases of anterolateral spines.

Basal segment of antennule (distal spines excluded) more than 1/3 carapace length, elongate, overreaching corneas, with two distal spines, mesial spine small, much shorter than lateral spine; and two spines on lateral margin, proximal one short, located at midlength of segment, distal one long, but not overreaching distolateral spine.

First segment of antennal peduncle with one strong distal spine on mesial margin, slightly overreaching second segment, and one small additional spinule on mesial margin; second segment with two long distal spines, mesial spine longer than lateral spine, overreaching antennal peduncle; penultimate segment unarmed.

Ischium of third maxilliped c. 1.5 times length of merus, distoventrally bearing spine. Merus bearing two spines on flexor margin, proximal well developed, distal small. Extensor margin unarmed.

Right cheliped missing. Left cheliped squamous, gaping, with short setae more dense on mesial, dorsal and lateral borders of articles. Cheliped more than 4 times carapace length.

Merus slightly longer than carapace, 1.5 times longer than carpus and slightly longer than palm; palm *c.* 2.5 times longer than high and slightly longer than fingers. Merus armed with four rows of spines. Carpus with several spines scattered on dorsal, mesial and ventral sides. Palm with several spines scattered on mesial and dorsal sides, one row of dorsolateral spines, not continuing along fixed finger. Movable finger with one mesial spine near its base. Fingers distally curving and crossing, ending in sharp point, with two spines near tips. Cutting edges with small teeth of different sizes.

Walking legs slender, furnished with several long, plumose, iridescent setae on dorsal margin, and some short setae on lateral borders. Second pereopod *c.* 2.5 times carapace length. Merus slightly longer than carapace, nearly 8 times as long as high, nearly 4 times carpus length and *c.* 1.5 times as long as propodus; propodus *c.* 8 times as long as high and slightly more than twice dactylus length. Merus with one row of 8-9 spines on dorsal border increasing in size distally, distal spine on ventral margin, both distal spines prominent. Carpus with long dorsal and ventral distal spines, and additional spines on dorsal margin. Propodus with one row of ten movable ventral spines. Dorsal margin of dactylus straight, slightly curving distally, with eight movable ventral spinules. Third pereopod similar to second. Epipods absent from all pereopods.

VARIATIONS. — Paratype with three pairs of epigastric spines, one postcervical spine on left side only, and two pairs of spines on anterior margin of second abdominal tergite.

REMARKS. — *Munida polynoe* is closely related to *M. ocellata* sp. nov., but both are distinguishable by several characters (see remarks under *M. ocellata*).

The new species is also related to *M. rufiantennulata* Baba, 1969 (BABA, 1969, 1988) from Japan and the Philippines. A comparison of *Munida polynoe* with the type specimens of *M. rufiantennulata* (see BABA, 1969) shows that both species can be distinguished by small but constant differences :

— the mesial spine of the second segment of the antennal peduncle is very long in the new species, clearly reaching beyond the antennal peduncle ; in *M. rufiantennulata* this spine does not overreach the antennal peduncle ;

— the propodus of the second walking leg is more than twice the dactylus length in the new species, it is clearly shorter in *M. rufiantennulata*.

Munida polynoe is also close to *M. longicheles* sp. nov. (see remarks under that species).

SIZE. — The males examined measured 8 and 9.5 mm.

DISTRIBUTION. — Tuamotu (Fakarava) Islands, 398 m depth.

13. *Munida evarne* sp. nov.

(Fig.13)

MATERIAL EXAMINED. — Tubuai Islands, NW Rapa, Récif Neilson, 22.05.1979, 100-130 m, dredge : 1 ♂ 6.0 mm (holotype, MNHN Ga 1908).

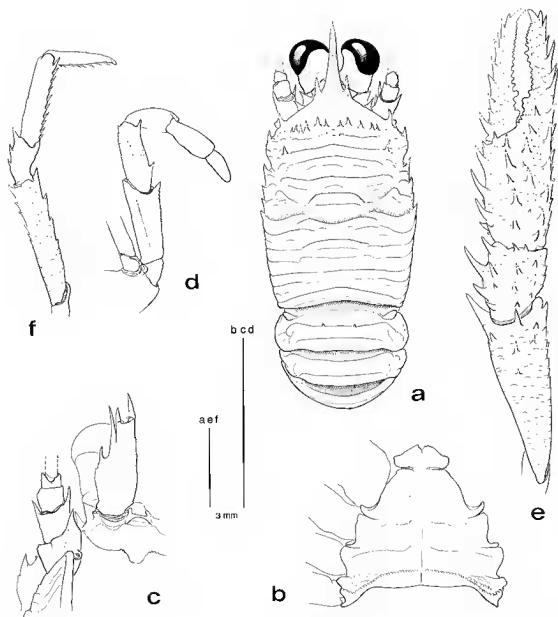


FIG. 13 — *Munida evarne* sp. nov., holotype, male 6 mm (MNHN Ga 1908) : a, carapace, dorsal view; b, sternal plastron; c, ventral view of cephalic region, showing antennula and antenna peduncles; d, right third maxilliped, lateral view; e, right cheliped, dorsal view; f, right second pereopod, lateral view.

ETYMOLOGY. — The name refers to one of the Nereids of the Greek mythology (Evame).

DIAGNOSIS. — Carapace dorsally armed with 11 epigastric spines ; parahepatic spines present. Frontal margins strongly oblique. Rostrum straight. Supraocular spines not reaching to midlength of rostrum and to end of corneas. Branchial margins with four spines. Thoracic sternites without marked carinae, lateral surface of seventh sternite with some granules. Second abdominal tergite with two small spines and one transverse stria. Eyes large. Distomesial spine of antennular basal segment longer than lateral. Distal spine of basal segment of antennal peduncle overreaching second segment. Merus of third maxilliped with two ventral marginal spines, dorsal margin unarmed. Chelipeds and walking legs lacking epipods. Cheliped fingers armed with spines along dorso-lateral and mesial margins. Dactylus of walking legs about 3/4 propodus length.

DESCRIPTION (holotype)

Carapace slightly longer than wide. Transverse ridges with dense, short setae and some long iridescent setae. Main transverse striae on posterior part of carapace interrupted in cardiac region. Secondary striae almost absent on branchial regions. Gastric region with one row of 11 epigastric spines, largest pair just behind supraocular spines. One parahepatic spine on each side. Remaining parts of carapace unarmed.

Frontal margins strongly oblique. Lateral margins slightly convex. First anterolateral spine short, clearly not reaching to sinus between rostrum and supraocular spines. Second spine somewhat smaller, preceded by one small spinule. Branchial margins with four spines, first one well developed, others reduced.

Rostrum straight, horizontal, much shorter than remaining carapace. Supraocular spines short, clearly not reaching to midlength of rostrum and to end of corneas, subparallel, upwardly directed.

Fourth thoracic sternite smooth, devoid of striae. Transverse ridges between fifth, sixth and seventh sternites obtuse, slightly granulated ; lateral parts of seventh sternite with numerous coarse granules.

Second abdominal tergite with one median pair of small spines. Second and third abdominal tergites each with one transverse continuous stria. Fourth and fifth tergites smooth.

Eyes large, maximum corneal diameter more than 1/3 length of anterior border of carapace between bases of anterolateral spines.

Basal segment of antennule (distal spines excluded) 1/4 carapace length, elongate, slightly reaching beyond corneas, with two distal spines, mesial longer than lateral ; and two spines on lateral margin, proximal short, located at midlength of segment, distal long, overreaching distolateral but not distomesial spine.

First segment of antennal peduncle with one short distomesial spine nearly, reaching to the end of second segment ; second segment with two distal spines, mesial spine longer than lateral spine ; penultimate segment unarmed.

Ischium of third maxilliped *c.* 1.5 times length of merus, distoventrally bearing spine. Merus with two small spines of subequal sizes on flexor margin (distal one absent in left appendage). Extensor margin unarmed.

Chelipeds subequal, slightly gaping, with numerous setae scattered on mesial and dorsal borders of articles. Right cheliped 2.5 times carapace length. Merus slightly shorter than carapace, twice as long as carpus and 1.5 times longer than palm ; palm 1.5 times longer than

high and nearly as long as fingers. Merus armed with several spines on dorsal, mesial and ventral sides. Carpus with several spines scattered on dorsal, mesial and ventral borders. Palm with several strong spines scattered on mesial and dorsal sides and one row of dorsolateral spines, continuing along fixed finger, reaching tip. Fingers distally curving and crossing, ending in a sharp point. Movable finger with one row of spines along mesial margin, reaching tip. Cutting edges with small teeth of various sizes.

Walking legs slender, furnished with long, plumose, iridescent setae on dorsal margins and some scattered setae on lateral borders. Second pereopod nearly twice as long as carapace. Merus slightly shorter than carapace length, 5 times as long as high, c. 3 times carpus length and 1.5 times as long as propodus; propodus c. 5 times as long as high and slightly longer than dactylus. Merus with a dorsal row of ten small spines, increasing in size distally, one long distoventral spine and two projecting striae on distal half of ventral margin. Carpus with long dorsal and ventral distal spines, and 2-3 additional spines on dorsal margin. Propodus with one row of 10-11 movable ventral spines. Dactylus with dorsal margin slightly convex on proximal half, slightly curving distally, with 7-9 movable ventral spinules. Third pereopod similar to second. Fourth pereopod shorter than second and third and less spinulated. Merus of fourth pereopod about half as long as that of second pereopod. Epipods absent from all pereopods.

REMARKS. — *Munida evarne* resembles *M. pasithea* sp. nov., but they differ in the following characters:

- the frontal border of the carapace is clearly more oblique in *M. evarne*;
- in *M. evarne* the distomesial spine of the basal segment of the antennular peduncle is longer than the distolateral spine, whereas in *M. pasithea* the distal spines are subequal;
- the lateral parts of the 7th thoracic sternite are ornamented with only a few coarse granulations in *M. evarne*, whereas in *M. pasithea* the granules are more numerous and cover the lateral parts of the 6th and 7th sternites;
- the spines on the flexor margin of the merus of the 3rd maxillipeds are much stronger in *M. pasithea*.

DISTRIBUTION. — Tubuai (NW Rapa) Islands, 100-300 m depth.

14. *Munida pasithea* sp. nov.

(Fig. 14)

MATERIAL EXAMINED. — Tubuai Islands, 03.1978, 300 m, dredge: 1 ♂ 5.5 mm (holotype, MNHN Ga 1905).

ETYMOLOGY. — The name refers to one of the Nereids of the Greek mythology (Pasithea).

DIAGNOSIS. — Carapace dorsally armed with five pairs of epigastric spines; parahepatic and postcervical spines present. Frontal margins slightly oblique. Rostrum straight. Supraocular spines not reaching to midlength of rostrum and to end of corneas. Branchial margins with four spines. Thoracic sternites without marked carinae, lateral surface of sixth and seventh sternites with many small granules. Second abdominal tergite with four pairs of spines and one transverse stria. Eyes large. Distal spines of antennular basal segment subequal in size. Distal spine of basal segment of antennular peduncle slightly

overreaching second segment. Merus of third maxilliped with two spines on flexor margin; extensor margin unarmed. Chelipeds and walking legs squamous, lacking epipods. Chelipeds fingers armed with one row of spines along dorsolateral and mesial borders. Dactylus of walking legs slightly shorter than propodus.

DESCRIPTION

Carapace slightly longer than wide. Transverse ridges mostly not interrupted, without setae. Main transverse striae on posterior part of carapace interrupted in cardiac region. Secondary striae absent. Gastric region with one row of five pairs of epigastric spines, largest pair just behind supraocular spines. One parahepatic and postcervical spine on each side.

Frontal margins clearly oblique. Lateral margins almost straight. Anterolateral spine situated at anterolateral angle, not reaching to the level of sinus between rostrum and supraocular spines. Second spine before cervical groove somewhat smaller than preceding. Branchial margins with four spines decreasing in size posteriorly.

Rostrum straight and horizontal, *c.* half as long as remaining carapace. Supraocular spines not reaching to midlength of rostrum, and end of corneas, slightly convergent and slightly directed upwards.

Fourth thoracic sternite with several arcuate striae. Lateral parts of sixth and seventh sternites with numerous small granules. Transverse ridges between fifth, sixth and seventh sternites obtuse, slightly granulated.

Second abdominal tergite with one row of four pairs of spines on anterior border. Second and third abdominal tergites with one transverse continuous stria. Fourth and fifth tergites smooth.

Eyes large, maximum corneal diameter about 1/3 the distance between bases of anterolateral spines.

Basal segment of antennule (distal spines excluded) slightly less than one-half carapace length, elongate, reaching beyond corneas, with two subequal, short, distal spines; and two lateral spines, proximal one short, located at midlength of segment, distolateral one long, almost reaching distal spines.

First segment of antennal peduncle with one strong spine on mesial margin, slightly overreaching second segment; second segment with two long distal spines, overreaching penultimate segment; penultimate segment unarmed.

Ischium of third maxilliped slightly more than 1.5 times length of merus measured along extensor margin, distoventrally bearing spine. Merus bearing two spines on flexor margin, distal one smaller. Extensor margin unarmed.

Right cheliped (left is missing) squamous, with numerous iridescent setae, more dense on mesial borders of articles. Cheliped *c.* 3 times carapace length. Merus as long as carapace, twice longer than carpus and slightly less than twice longer than palm; palm 2.5 times as long as high and slightly shorter than fingers. Merus armed with four rows of spines. Carpus with one row of spines on mesial margin and several spines scattered on dorsal and lateral sides. Palm with several spines scattered on mesial and dorsal sides and one row of dorsolateral spines, continuing along fixed finger, reaching tip. Movable finger with one row of spines along mesial border, reaching tip. Fingers distally curving and crossing, ending in sharp point. Cutting edges with small teeth of different sizes.

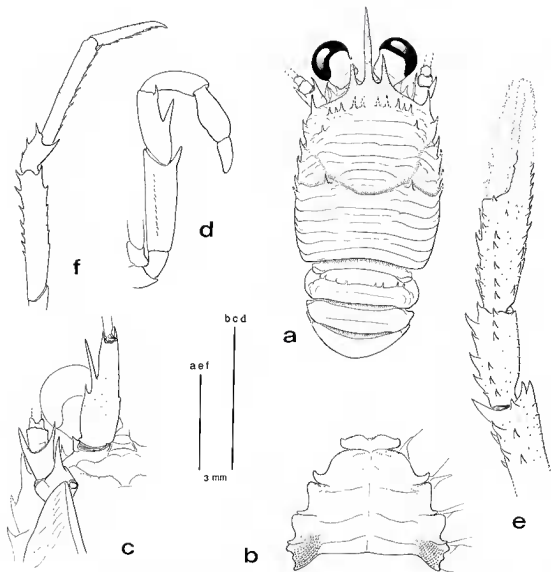


FIG. 14. — *Munida pasithea* sp. nov., holotype, male 5.5 mm (MNHN Ga 1905) : a, carapace, dorsal view ; b, sternal plastron ; c, ventral view of cephalic region, showing antennula and antenna peduncles ; d, right third maxilliped, lateral view ; e, right cheliped, dorsal view ; f, right second pereopod, lateral view.

Walking legs slender, furnished with long, plumose, not iridescent setae on dorsal margins and some short setae scattered on lateral borders. Merus of second pereopods slightly shorter than carapace length, more than 6 times as long as high, 3.5 times carpus length and c. 1.5 times as long as propodus; propodus more than 6 times as long as high. Dactylus of second pereopod broken, that of third pereopod elongate, slightly shorter than propodus. Merus with one dorsal row of eight spines, one long distoventral spine and one projecting stria on distal half of ventral margin. Carpus with one long distal spine, three additional spines on dorsal margin and one distal spine on ventral margin. Propodus with one row of nine movable ventral spines. Dactylus of third pereopod elongate, dorsal margin straight, slightly curving distally, with six movable ventral spinules. Third pereopod similar to second. Fourth pereopod shorter than second and third and less spinulated. Merus of fourth pereopod c. 3/4 as long as that of second pereopod. Epipods absent from all pereopods.

REMARKS. — Unfortunately the cheliped of the holotype was broken after it was studied, but before it could be illustrated. Therefore, the figure given here is a partial reconstruction from the description.

Munida pasithea is closely related to *Munida evarne* sp. nov., however they are easily distinguishable by several characters (see remarks under *M. evarne*).

The new species is also close to *Munida albiapicula* Baba and Yu, 1987, from Taiwan (BABA and YU, 1987; BABA, 1988), but both species can be distinguished by the following characters :

— the supraocular spines are very short, not reaching to the middle of rostrum or to end of corneas in the new species; these spines are much longer in *M. albiapicula*, distinctly over reaching midlength of the rostrum;

— the spines of the antennal peduncle are shorter in *M. pasithea* (cf. fig. 14c and BABA and YU, 1987, fig. 2c).

DISTRIBUTION. — Tubuai Islands, 300 m depth.

Acknowledgements

We are very grateful to J. POUPIN, scientific leader of the "Marara" cruises and to A. CROSNIER (ORSTOM) for making this interesting material available to us. The latter, as well as K. BABA and A. L. RICE critically read the manuscript and suggested many improvements. P. DAVIE greatly helped us with the first English draft. The ink illustrations are by F. THEUREAU, the colour slides were made by J. POUPIN. To all of them, we express our thanks.

REFERENCES

- ALCOCK, A., 1894. — Natural History Notes from H.M. Indian Marine Survey Steamer "Investigator" Commander R. F. Hoskyn, R. N., late commanding. — Series II, No. 1. On the results of the Deep-Sea Dredging during the Season 1890-91 (continued). *Ann. Mag. nat. Hist.*, (6), 13 : 225-245, 321-334.

- 1901. — A descriptive catalogue of the Indian Deep-sea Crustacea Decapoda, Macrura and Anomala in the Indian Museum, Being a revised account of the deep-sea species collected by the Royal Indian Marine Survey Ship Investigator. Calcutta. 286 + iv pp., 3 pls.
- ALCOCK, A., and A. R. S. ANDERSON, 1895. — Crustacea. Part III. Illustrations of the zoology of the Royal Indian Marine Surveying Steamer "Investigator", pls. 9-15, Calcutta.
- BABA, K., 1969. — Four new genera with their representatives and six new species of the Galatheidae in the collection of the Zoological Laboratory, Kyushu University, with redefinition of the genus *Galathea*. *Ohmu Occ. Pap. Zool. Lab. Fac. Agr. Kyushu Univ.*, 2 (1) : 1-32.
- 1974. — *Munida brucei* sp. nov., a new galatheid (Decapoda, Anomura) from the east coast of Africa. *Annottes zool. jap.*, 47 (1) : 55-60.
- 1981. — A new galatheid crustacean (Decapoda, Anomura) from Hawaiian Islands. *J. Crust. Biol.*, 1 (2) : 288-292.
- 1986. — Two new species of anomuran crustaceans (Decapoda : Chirostyliidae and Galatheidae) from the Andaman Sea. *J. Crust. Biol.*, 6 (3) : 625-632.
- 1988. — Chirostyliid and Galatheid Crustaceans (Decapoda, Anomura) of the "Albatross" Philippine Expedition, 1907-1910. *Res. Crust.*, Special Number 2 : v + 203 pp.
- 1989. — Chirostyliid and Galatheid Crustaceans of Madagascar (Decapoda, Anomura). *Bull. Mus. natl. Hist. nat., Paris*, 4 sér., 11, section A, (4) : 921-975.
- BABA, K., and H. YU, 1987. — *Munida albiapicula*, a new species of anomuran crustacean (Decapoda : Galatheidae) from Taiwan. *Bull. Inst. Zool., Acad. Sin.*, 26 (4) : 331-335.
- BRUCE, A. J., 1989. — *Pertelimenes poupini* sp. nov., a new anemone-associated shrimp from deep-water traps (Crustacea, Decapoda, Palaemonidae). *Bull. Mus. natl. Hist. nat.*, Paris, 4e sér., 11, section A (4) : 851-863.
- CHAN T.-Y., and A. CROSNIER, *in press*. — Crustacea Decapoda : Studies of the *Plesionika narval* (Fabricius, 1787) group (Pandalidae) with description of five new species. In : A. CROSNIER (ed.), Résultats des Campagnes MUSORSTOM, vol. 9. *Mém. Mus. natl. Hist. nat.*, Paris, sér. A.
- GUINOT, D., 1991. — Etablissement de la famille des Poupiniidae pour *Poupinia hirsuta* gen. nov. sp. nov. de Polynésie (Crustacea Decapoda Brachyura : Homoloidea). *Bull. Mus. natl. Hist. nat.*, Paris, 4^e sér., 12, 1990 (1991), A, (3-4) : 577-605.
- MCLAY, C. L., 1991. — A small collection of deep water sponge crabs (Brachyura, Dromiidae) from French Polynesia, including a new species of *Sphaerodromia* Alcock, 1899. *Bull. Mus. natl. Hist. nat.*, Paris, 4^e sér., 13, A, (3-4) : 457-481.
- PEYROT-CLAUSADE, M., 1989. — Crab cryptofauna (Brachyura and Anomura) of Tikehau, Tuamotu Archipelago, French Polynesia. *Coral Reefs*, 8 : 109-117.
- RICE, A.J., and M. DE SAINT-LAURENT, 1986. — The nomenclature and diagnostic characters of four north-eastern Atlantic species of the genus *Munida* Leach : *M. rugosa* (Fabricius), *M. tenuimana* G.O. Sars, *M. intermedia* A. Milne Edwards et Bouvier, and *M. sarsi* Huus (Crustacea, Decapoda, Galatheidae). *J. nat. Hist.*, 20 (1) : 143-163, fig.1-4.
- SAINT LAURENT, M. DE, and E. MACPIERSON, 1988. — *Munida benguela*, espèce nouvelle d'Afrique du Sud. Comparaison avec *Munida sanctipauli* Henderson, 1885 (Crustacea Decapoda Galatheidae). *Bull. Mus. natl. Hist. nat.*, Paris, 4 sér., 10, section A, (1) : 105-115.
- TITGEN, R. H., 1987. — New Decapod Records from the Hawaiian Islands (Crustacea, Decapoda). *Pacific Sci.*, 41 : 141-147.
- ZARENKOV, N.A., and I.V. KHODKINA, 1981. — Decapoda. In : Benthos of the submarine mountains Marcus-Necker and adjacent Pacific regions. *Akademiya Nauk SSSR*, Moscow : 1-186.
- ZARIQUEY-ALVAREZ, R., 1952. — Estudio de las especies europeas del gen. *Munida* Leach 1818. *Eos*, 28 : 143-231.